The Builder.

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The Exact Relation between the Food of Plants and the Refuse of Towns.

FREQUENTLY and fully as the subject of the treatment and utilisation of sewage has been discovered, there is a mode of investigation that has not hitherto been applied with the accuracy that is both possible and desirable. We have analysis, indeed, pushed to the utmost minuteness of detail, both as regards the chemical composition of plants, and the chemical elements that we send to poison our rivers. A certain balance is known to exist between what is taken from the soil for human and animal food, and what is returned to the soil, or to the atmosphere, by the result of the vital process. But what has been, in our opinion, overlooked, is the mode in which the question is affected by that little word *or*. Food is consumed in a tangible form. The results of the digestion of food are partly tangible and partly invisible. The effect of the combustion that goes on in the living animal is a matter of primary importance. We wish, then, again to inquire into the subject of what is returned to the soil, and to investigate how far the actual chemical outcome, by balancing the consumption of the food of plants, allows of an economical utilisation of sewage.

The food of man is composed of certain elementary substances, known to chemistry, which exist abundantly around us, but which human skill has not hitherto been able directly to combine, so as to produce the same result that is continually being effected in the great laboratory of organic life.

Human food consists of two great groups, or categories; first, that which is the direct product of vegetation; and, secondly, that which is its secondary product; having been assimilated, in the first instance, by herbivorous animals, and then presented to human consumption in the form of flesh, milk, eggs, or some edible of animal origin.

The attention of scientific chemists has been directed to the important quest of the means of directly combining the chemical elements of food. But the greater progress in this direction with which we are acquainted consists in the chemical formation of certain flavours, indistinguishable from those of fruits.

In regarding the production of human food it will be convenient, in the first instance, to regard the case of wheat, which in this country forms the staff of life, and on which subsistence, though not luxurious, is possible.

It results from statistical inquiry that the consumption of wheat may be taken at one sack of flour, or 5·71 bushels of wheat, per head per annum. This allowance is equal to 3,483 lb. of wheat per head per annum, or ·93 lb. per diem.

The fair average return of our cultivated wheat-lands is stated by the most careful students of the farm statistics of the day at quantities which, reduced to the simplest expression, amount to a yield of 1,570 lb. of wheat per acre per annum. We take at present no notice of the straw, because, in one form or another, it is returned to the soil, if not exported.

In the discussions now raised as to the value of sewage as manure, while very much information has been collected, the subject has never yet, so far as we are aware, been brought to that definite test for which analytical chemistry furnishes the means. In fact, from the form in which the ultimate analysis yet carried out has been left by the best writers on the subject, it is tolerably certain that the method we now propose to pursue has not hitherto been pursued.

We are not about to enter into that question of the relation of population to area which is suggested by the remark that the annual consumption, per head, of wheat is equal to the produce of nearly one-quarter ($\frac{571}{2373}$ parts) of an acre. We have to see, first, what we take out of the land by a wheat crop, and what we therefore require, in some way, to return to it; and, secondly, how far the refuse of our towns is adapted to furnish that supply.

We take the average wheat crop at 25¾ bushels, of 61 lb. per acre, which gives, in round numbers, 1,570 lb. of wheat.

This wheat, by analysis, consists of (1) 220 lb. of water, of which we take at present no further heed; (2) 25 lb. of mineral ingredients; (3) 230 lb. of flesh and force producing, nitrogenous matter; (4) 1,095 lb. of force-producing matter, which includes 523 lb. of pure carbon.

The elements of the food of plants, besides the small portion of mineral matter which they accumulate in growth, are these,—water, ammonia, and carbonic acid. From the ammonia that is fixed in the process of vegetable growth the nitrogen in the vegetable substance is derived. From carbonic acid the large quantity of carbon is extracted. Both carbonic acid and ammonia are evolved by the organic processes of animal life. They are so produced, to a large amount, in the form of imperceptible vapour. Much of this is dissolved in rain, and thus brought to the roots of plants.

We require, therefore, either by natural or by artificial means, to return to every acre of wheat-growing land 25 lb. of mineral matter in the year. This matter consists of lime, magnesia, silica, soda, potash, sulphur, phosphorus, oxide of iron, and chloride of sodium or common salt, in proportions into which it is not necessary here to enter. We arrange them according to their proportionate weights.

With regard to the more universal elements of vegetable tissue, it will be seen that the flesh and force producing, or nitrogenous, portion forms but the fifth part of the force-producing, or carbonaceous, matter. Each of these supplies is derived mainly, under ordinary circumstances, from the atmosphere. But if we seek to feed our plants as it were by hand, we must be careful as to the appropriate mixture of the food which we supply. To give in undue profusion a single element, or even all the proper elements with a single exception, is not to feed, but to starve. It is therefore necessary to learn first how much of the mineral matter necessary for the crop is already abundant in the soil and what is deficient and has to be returned; and secondly, how far we can supply a store of the more subtle elements which, in a liquid or aërial state, are equally requisite for the luxuriance of the crop with the solid mineral matter.

We have now to consider the question of how far the ordinary contents of town sewage contain, in the proportion required by vegetation, the proper elements for its support.

The chemical composition of the *excreta* of human life, entirely undiluted, contains 92·88 per cent. of water, and 7·12 per cent. of suspended and dissolved matter. If we allow 25 gallons per individual for the water-supply, which is a smaller allowance than is considered desirable, we shall have a dilution of 100 gallons of *excreta* by 9,130 gallons of water, or 91 to 1. We may say in round numbers, therefore, the dilution is 100 to 1.

These suspended and dissolved matters may be conveniently classed in three groups. Of the seven parts of which we first spoke, the mineral matter forms a tenth. Gaseous matter, including the non-mineral constituents of the sulphuric and phosphoric acids, forms a fourth; and the remaining 65 per cent. consists of organic matter.

In other words, we may take a unit of population as the equivalent of 9,000 gallons of undiluted sewage, and regard it as producing in the year 7 lb. of mineral water, 18 lb. of gaseous matter, and 46 lb. of organic matter. This result is closely accordant with analyses carried on for different purposes, and is at all events sufficiently accurate to form the basis of further inquiry.

The commercial value of the mineral matter it may be difficult precisely to fix. The most valuable portion is the phosphorus, which is found in small quantity. Phosphate of lime is reckoned as worth 2s. 3d. for every 1 per cent. in a ton. The proportion of the mineral elements is that in which they are required for the crop, but the value of their return to the soil depends not only upon this fact, but upon the question of what mineral elements are naturally abundant in a given soil, and what are those in which it is deficient. The phosphorus is the only mineral for the collection of which it is absolutely necessary to have recourse to manure of animal origin.

The gaseous matter, whether present in the form of nitrates or other salts, or as ammonia dissolved in the water, may be taken with the mineral matter in forming an estimate of commercial value. If the 21 lb. of mineral and gaseous substance be priced at 1d. per pound, it will probably exceed the purchase-money likely to be obtained.

There remains the important question of the organic matter, which forms nearly two-thirds of the non-aqueous contents of sewage. In this, it is evident, lies the main knot of the subject. In the various methods proposed for the treatment and utilisation of sewage the most opposite views are entertained as to the value of the organic matter. In the various analyses it always appears in this comprehensive and uninvestigated condition. By some persons it is regarded as a fertiliser of high value; by others it is considered as merely the carrier and seed-bed of poison. It is desirable, therefore, to discuss this portion of the subject with some precision.

Before passing, however, from the consideration of the mineral elements, we must refer to a point which, although by no means novel, comes out unsought in our calculations. The mineral matter contained in the wheat consumed, at the above rate, by four persons in a year is a little over 22 lb. The sewage resulting from the same number of persons contains 28 lb. Ultimately, no doubt, that returned to the soil must equal that taken from it, with the exception due to our mode of sepulture. The difference in this case arises from comparing the crop containing the smallest proportion of mineral matter with results derived from a mixed diet. Oats, for example, contain 3·0 per cent., and barley and beans each 3·5 per cent., of mineral, against 1·6 per cent. in wheat.

But the balance is very suggestive as to the questionable economy of conveying to the soil, for the purpose of fertilisation, the sewage arising from a population at the rate of from 25 to 1,100 per acre; the first being that recommended as the most lucrative, and the second being that actually in use at Merthyr Tydfil.

The organic matter which forms 64 per cent. of the solid contents of unadulterated sewage is not more minutely analysed in any of the works that we have consulted that discuss modes of treatment and of utilisation. The suspended, as distinguished from the dissolved, solid matter may be taken principally to consist of albumen.

At all events, if we take the analysis of that substance for our guide, any error of deduction will lie within limits that can be readily ascertained.

The albumen of the blood, according to MM. Dumas and Cahours, consists of 53·32 carbon, 15·70 nitrogen, 7·29 hydrogen, and 23·69 oxygen in 100 parts.

It is a remarkable and interesting fact, which seems to have escaped notice, that 100 parts of albumen, thus analysed, have required for their production exactly 250 parts of carbonic acid, ammonia, and water combined. The elimination of 150 parts of oxygen has converted that mixture into organic substance. At least, such is the exact result of the numeric value of the elements and their known combinations.

The combination of 150 volumes of oxygen, if we allow the degree of heat to be produced that is due to combination with carbon, is accompanied with the production of 200 units of heat. Omitting the addition due to the combination of the hydrogen with the nitrogen, we have thus the measure of the heat required for the liberation of the same weight of gas. In the vegetative process by which albumen is formed, the heat of the sun supplies this requisite. The leaves act as the organs for expiring the liberated oxygen. We thus obtain a view of the mode of formation of vegetable albumen, by weight and proportion.

The compound thus formed is one of the constituent parts of the vegetable structure, and is especially to be found in the seeds and fruit that form the main part of animal food. In the process stimulated by hunger, the albumen is taken, unchanged, into the animal system. We need not trace the entire circulation, but we find the substance finally either consumed by the respiration, giving out its proper *quotum* of heat, for the supply of the animal warmth, or passing in an undecomposed state into the localities in which we now have to deal with it.

Albumen, thus formed, is of course unfit for animal food. It is equally unfitted for vegetable food. In order to allow of its assimilation by the plant, it is necessary to return to it that proportion of once and a half its weight of oxygen, of which it was deprived by the vegetative process that formed it. When this has not been done in the natural course, that is to say, in the animal body, it is only to be done either by extension of surface, so as to expose the greatest amount possible to an oxygenating process, or by raising the temperature, so as to turn a slow into an active combustion.

There is, indeed, one class of organism to which decaying organic matter furnishes an appropriate *pabulum*. The fungi are ordinarily regarded as vegetables; but they possess not a few of the peculiarities proper to the animal kingdom. Chief among these are the nitrogenous character of their tissues, and their habit of feeding upon decaying organised substances. Their appearance, under conditions favourable to pestilence, is invariable. Their growth and reproductive power are of fabulous rapidity. They are the scavengers of nature; but, like their superior brethren in the practice, are best kept at arm's length. Among them are to be found the cholera fungus, the potato fungus, and, if medical men are right in their suspicions, the countless and invisible spores that are the very means of communicating zymotic disease. In the albumen of the sewage this order of beings has a naturally provided home and vehicle. The assimilation, made by man, is out of the ordinary course of nature to remedy. Her sole *organum*, for the purpose, is the fungus; its activity is extreme, but the effect is at least as redoubtable as the mischief which has called for its commencement.

Each of the four elements which constitute albumen is necessary to the growth of plants. But they are only available, so far as we know, to support that growth, when they are present in due proportion, and in such combinations as are suitable for vegetable assimilation. The organic matter of sewage, therefore, as far as it is albuminous, is entirely valueless as manure, besides being liable to be regarded as the seat of an active poison. It is of primary importance to give prominence to this often neglected truth.

While the above analysis exhibits the value of town sewage as rather less than one half-penny per ton of effluent, undiluted liquid, or 1s. 9d. per unit of the population per annum, it is well to check the calculation by the results attained by the best cases of sewage farming.

For the economical treatment of sewage we are told that an acre should be allotted to every 25 souls of the population. At Merthyr, on the other extremity of the scale, an acre appears efficiently to disinfect the sewage of 1,100 souls. Here is a wide margin.

The highest expenditure that we have yet seen recorded in high farming for manure has reached the price of 3*l*. per acre per annum. This, of course, is unusual. The crops on this farm have been worth 13*l*. 10s. per acre in wheat, and 14*l*. 16s. in clover and sainfoin. We refer to Mr. Prout's farm in Hertfordshire. Generally speaking, 40s. would be an outside price per acre for manure.

If we take the recommended allowance of 25 souls per acre, and what has been hitherto regarded at the low value of 5s. 8d. per head of inhabitants for the sewage, fertilising matter to the amount of 7*l*. 1s. 8d. is annually placed on every acre thus treated.

If we apply the same theoretic value to the proportion in force at Merthyr, of 1,100 souls to an acre of filtering ground, we shall find that fertilising elements, according to theory, to the value of 311*l*. are annually poured into that acre.

The highest returns claimed from the use of sewage manure have been at the rate of from 32*l*. to 40*l*. per acre. We have not the exact details, but we find that a growth of Italian rye grass amounting to 7 tons per acre is stated to have been produced. If we took last year's price for hay,—this would give a higher value, but that may be considered as exceptional,—31*l*. 10s. would be the return for the hay at 4*l*. 10s. per ton.

In water-meadows without manure, or with an occasional top-dressing of bone-dust that will not amount to more than 14s. per acre per annum, crops of 5 tons per acre, including that which is eaten on the ground, are about the maximum. There is little doubt that these may be materially augmented by such a disposal of the irrigation as should avoid the present wasted area of innumerable water-carriers. But it is possible that this may cut both ways,—so that we take the difference of yield between the ordinary water-meadow and the sewage-farm at 2 tons of hay, say 9*l*. per annum. This is, therefore, the total produce of the application of a quantity of sewage averaging, in the value hitherto nominally attributed to it, at from 6*l*. 10s. to 312*l*. Thus it seems that the result of practice is in exact accordance with our analyses.

That the effluent water from sewage must go through the ground to be purified, we take to be an undoubted maxim in the present state of sanitary science.

But if we complicate this problem, in itself not a simple one, by attempts to derive from the sewage materials fitted for the food of plants which do not exist in it, in a state in which plants can assimilate it, and which we cannot convert into such a state, we go in the wrong direction. Chemistry and practice unite in one testimony. The organic contents of sewage are not manure. They are only poison. They must not be preserved, but destroyed.

THE EDUCATION OF THE ARCHITECT.

At the opening meeting of the new Architectural Association of Ireland, mentioned in another page, Mr. J. J. O'Callaghan, the first president, read the following instructive address:—

By learning to make truth the foundation of your education, you may hope in time to be able to design: truth is absolutely necessary to it, and no originality can assist a design without this one grand element; once depart from it, and you get into troubled waters. As written recently by an eminent architect, "It is truth only in every line and every detail which can ever make great architecture."

A more extensive course of study than is generally given is necessary for the architectural student. It is too much the habit now-a-days for a student to start too early in practice for himself; it often happens that he begins immediately on being out of his articles, as if the three or five years spent in the principal's office is all that are necessary. This is but a small portion of his education, even when supplemented by all the exertion of which he is capable. I know many pupils work very hard in this way, but I fear that with others it is only the mere routine of the office that constitutes their art-education.

The preparation for the profession is one of our weakest points, and in this respect France and other continental countries have the greatest advantage over us. It is necessary that a good general and scientific education, and a fair knowledge of drawing, should be learned at school; this should include a general knowledge of perspective, its principles and practice, and good training in freehand drawing. When you have entered on your duties as pupils you will find you are in the right way to become artists not only in name, but also in reality; and you will the more readily work your way up in the office, and will the sooner be entrusted with responsibility. Then a knowledge of construction and the uses of materials should be your next care; this will give you a great confidence in your office work, because you shall then understand what you are doing, and there will be no hesitation in any constructional matter.

You should lose no opportunity of acquiring a thorough knowledge of all the trades; this is absolutely necessary for the making of your working drawings. When some new ideas are well and clearly laid before workmen, you find it difficult to get them to realise them, it being too much their habit to endeavour to do things their own way. How can you, then, possibly expect they should understand them if they are imperfectly sent from your office, much less hope they will follow you with confidence or respect? Without this knowledge your client will not have that confidence in you which is necessary; while the builder, who is really anxious to have the benefit of your assistance, and to follow your plans, so often finds that in matters under his own province you are at fault, that your influence is weakened. Were the educational defect removed, this state of things could not exist, and the aid of the architect would more generally be sought. The public would know their interests were safe in your hands; they would feel that technical knowledge and artistic taste were employed in their behalf, and they would unreservedly place themselves in your hands, and the cause of art and the public would be served in the end. The necessity for this is very apparent in our own country, where the position of the architect is very little understood, and good architecture, I fear, very little appreciated.

In immediate connexion with the attainment of this knowledge, the student should ever remember that a liberal education ought to be the ground-work of his profession, and that it will require his utmost exertion to fit him for that which ought to lead the sister arts. Architecture is the real foundation of the fine arts, and ought to be the guiding spirit to them. For this purpose the intellect must be educated and the imagination cultivated. This will be necessary, if we wish to imprint on our works,—which are so influenced by our modern requirements, and by the influences which science has opened up,—the spirit or life which is visible in those works, which we would probably take as our models from either the Classic or Gothic schools, or, it may be, a combination of the two.

It is of the greatest consequence that a thorough knowledge of our history should be known, for the architecture of a country is intimately connected with its history, and the contemplation of the one brings forcibly before our minds the beauties and peculiarities of the other. And here I may mention the great fund of study which the ancient buildings of Europe afford the student. In our own country we have many examples of every period, although they are not so extensive or so elaborate as those in England or on the Continent. They afford most interesting studies to the student, and the details are of a distinctive character that marks them at once as national. I would, therefore, suggest that you begin at home, and let your tastes be formed there. I know no more interesting study for the junior members than a day's, or a week's, or a month's, sketching at some of our fine old ruins, and I trust it may be my good fortune to join the members of the Association in their journeys through Ireland on the occasion of inspecting some of those splendid monuments of the piety and art-knowledge of our ancestors. We owe a deep debt of gratitude to those who, like Petrie and others, drew our attention to those splendid monuments erected by our forefathers. I do not know a better way for a student to learn the rudiments of real architecture than by carefully sketching and measuring on the spot those remains, particularly noting the mouldings and construction; and this is reckoned of such importance that I believe nearly all the art societies offer special prizes for the purpose. I am happy to see one included in the prize-list of this Association. Not only the

details should be sketched: the plan should be well studied; the purpose of the building, and how it has answered that purpose, should be carefully investigated. In this investigation I would suggest that no one style be adhered to, as beauty and good may be found in all. The remains of Athens and Rome have their admirers, and those of the Middle Ages are affectionately regarded by numbers. As for my part, I believe it is quite possible to cull from all without losing any of the feeling or beauty which either possesses,—not, indeed, to attempt to produce a mixed style of architecture, which I consider most undesirable. Ground your necessities of the age either on Gothic or Classic works, treat them with originality, and you will have a sufficiently new style, if you combine in your work those truths which they so beautifully express. I see no reason whatever why we, though loving the pointed arch, should neglect the use of the round; and in our Gothic architecture we may well introduce that simplicity and repose which is to be seen in some Classic work. This has been very successfully achieved by the Italian architects, who introduce into their work some of the distinctive features of the Classic, and with unity and harmony. Even in the same windows they introduced the two kinds of arches, the inner arch being often semicircular, while the outer one was pointed. This gave a great appearance of strength, and the effect is exceedingly good. We must remember ever that literature has great influence on architecture, and is intimately associated with it.

I am very happy to believe that great strides are being made in the direction of educating the public mind, and that exhibitions of art are being more and more appreciated. I believe we may trace in the recent revival of Gothic architecture, that the very education for it was by bringing prominently before the minds of the people the associations connected with those interesting remains; that the very way was opened for the actual results achieved by Pugin and others who laboured in the same field.

The pupil should early learn to sketch, and sketch well. Sketching is a power in the hands of an architect. It is impossible for you to be able readily to put together your ideas unless you sketch well: it gives you the greatest facility in grouping your buildings, and even planning them. You have the means of storing up in your minds every good idea, detail, and group. This power of sketching, combined with a thorough knowledge of perspective, is of the greatest benefit to yourselves in your future practice; it enables you to take in constantly those works which may pass before you on all occasions. If you have this power, you will be able to get through a much greater amount of work than would be possible for you without it, no matter how well versed you may be in everything else that relates to your profession. When you have acquired this power of sketching well and freely, you can then take up some works, and measure and draw them carefully; by this means you will be doing more to understand their spirit, and feel those principles of truth and reason which they contain. It is only when you have carefully gone through this work, and understand thoroughly their plans, sections, and elevations, and their construction, that you can catch their ideas, which ideas once thoroughly impressed on your minds can never be completely effaced. You can use them as your own, without feeling that you are mere copyists. These very ideas will arise in your minds, and will be to you of the greatest assistance when you most require them. Then from the power that sketching gives you in educating your eyes and your tastes, when you have the mind filled with the good things which you have already seen and sketched, it will not be possible for you to be satisfied yourselves, or to satisfy others, with what is unreal or bad. It will give you an easy path over many difficulties, and the fears that may perhaps arise when you have planned an original group will soon disappear, if your minds are stored with those ideas which have been formed long before in your sketching tours. You will then avoid starting with a sham. This is a very serious evil, and one against which you will have carefully to guard—this endeavour to appear what we are not. It is of the utmost dishonesty, and yet appears to be almost universally practised; the worst feature of it is, that it precludes us from the use of really good materials, and how disappointing in the end it is. These shams are practised almost everywhere and in almost every place, and yet every one appears to know it is so. How often do we see that plastering—very good in itself, if properly applied—is utterly destroyed when made to imitate stone? This is so generally adopted that it is most difficult to get even the workmen to do this class of work without their putting the stone lines upon it. It would be annoying, if it were not such a serious subject, to hear the explanations given and the defence offered by them on this subject. Then we have metal and wood painted to imitate stone and marble, and how often are we allowed to have the simple colours applied to our work? No! we must have our wood painted to imitate oak, or maple, or such like, forgetting all the time how very beautiful the natural colour of the wood is, or how much better and more beautiful the simple colours would be. This we must never fail to oppose with all our powers, no matter from what quarter it proceeds; it is a combination of extravagance and vile taste. It removes us altogether from what we should have in view. Then in the matter of representing marble, do we not see it every day, or on every side of us? and this in a country where we have most beautiful specimens of the real material to select from. It is sad to find that all this occurs amongst us at the same time that real materials and rich colours are abhorred: we are very far behind in this respect. The public appears to be devoid of true feeling on this most important point; we should therefore do all in our power to awaken a love for truth, and beauty, and colour, in our architecture. We certainly have many opportunities of doing so in using the brick, granites, limestones, sandstones, and marbles, which may now be easily obtained in this country, and which in every respect are such admirable materials. By using our materials thus we shall tend to educate the eye and give strength and interest to our buildings; we may then hope to see love for the picturesque and beautiful become more general, and regularity and plainness shall not be considered the only beauty.

Sketching and measuring also lead on to the closer examination of those works you take up, and give you a power of thinking for yourselves otherwise very hard to attain; you will find out the points of them that please you most, and shall be enabled to mark carefully the treatment adopted for different works, and how the various difficulties were overcome; and, though last, not least, it will give you a thorough knowledge and power to use the materials in their best and most natural manner. You cannot love those buildings too much, nor is there any fear you may become copyists if you approach them in a proper spirit, determined to educate yourselves by them, not to select a piece of them for a particular work. It is impossible for a man who loves his art well not to cultivate it, and derive pleasure from its practice, which will be utterly impossible to a mere copyist. The study of those works will also tend to tone down that spirit which would perhaps sometimes tempt you to do queer things, in order to indulge in what is termed "originality." That which is natural will produce sufficient originality. In fact, to my mind, if you make use of your wants properly and naturally you shall always produce that originality which is desirable; truth in planning and in construction will always produce as much of it as is necessary to make our architecture picturesque and beautiful. It is the absence of truth in our architecture, coupled with the want of art-education, that produces the thoroughly uninteresting character of almost all our buildings. That which is actually bad and inconvenient is adopted, more particularly in our dwellings, because the public mind cannot realise the fact that truth should govern our architecture; the spirit of doing what has been already, though very badly done, appears yet to govern the masses, and they dread anything in the way of real art in architecture.

Then whim must be avoided;—that spirit of singularity which is occasionally visible,—that restless, uneasy striving after effect which marks conceit or disregard of truth. This uneasy spirit generally arises from ignorance in treating the materials we have in hand, or the neglect of the study of those models we have been speaking of, but generally in the absence of that truth which is the real foundation of good design. You should approach each work in its true spirit, endeavouring to meet each case on its own special merits, making the design as natural and as suitable as possible.

You should above all avoid laziness in design; you must quit that spirit of mere imitation which your ease would sometimes prompt. You should blush to copy or to make use of any of the works you may see in your principal's office; you should imitate what you find there in order that you also may one day become original. The practice of copying and making up a design of another's works, and trying to deceive yourselves thereby that you have designed a building, is a most dishonourable practice, and it is utterly opposed to the true spirit of art. Once you rest satisfied with mere copying in this respect, you are lost to the spirit of the true artist, and you cannot take any pleasure in your profession. The true architect is always contriving, and never rests satisfied until he is convinced that he has realised the best effect possible. He goes on, ever improving on the past, till, when old age comes on, he feels himself young still in the pursuit of art, and there will be no fear that his work will become uninteresting to him. The ever-changing, ever-grappling with the work will be to him a constant source of pleasure, and he has his own reward in contemplating the life-like creations of his fancy,—than which I know no greater pleasure. You have many opportunities for variety in your practice, for although sameness in general appearance is too generally sought for, yet in very few cases does one client wish to have that which has been already adopted by another. If you go into each work with spirit, it will prevent poverty in design, and produce that originality which we should all look for.

It is most essential that architecture should hold a prominent place in our public schools and universities, for is it not sad to find that, in many cases, the first idea a pupil gets of that which is to be his profession is in the office in which he is articled, and that he oftentimes takes a pencil in his hand for the first time when he enters the office as a pupil? I hope the day is not far distant when professorships of architecture will be established in all our colleges and universities, and thus architecture and the fine arts will form part of general education for all classes.

In England we find many opportunities for art-study open to the student, not only in the colleges and universities, but in the Royal Academy and the magnificent collections at South Kensington and elsewhere. I believe in only one university or college in Ireland does a chair of Architecture exist: this is a very great want, and one that should not be allowed to exist; but the architects of the country must agitate, when perhaps attention will be paid to their wants. In the face of those discouraging facts, it is the duty of the younger members of the profession to be diligent and industrious, and show thereby that, had they the means prescribed above, they would avail themselves of them. I believe, notwithstanding all the drawbacks, if a student is industrious, he has all the necessary means open to him for a good art-education, if he will only supplement the information he receives from his principal by his own exertions in the workshop, on the building or sketching tour; and pupils had better realise this fact as soon as possible—that architecture is an art not to be learned easily or slightly, and the sooner they put their shoulder to the wheel the better. If pupils will not educate themselves, or at least receive the education afforded by their opportunities voluntarily, then the sooner we have examinations for admission to the ranks of the profession the better. Let the Institute establish an examination, the passing through which will be recognised as a necessary qualification for the profession. I am afraid in many cases the position of the profession must suffer, unless compulsory education be established; outsiders will come into the profession,—men without sufficient education. Even in this age, the position of an architect is not understood; the difference between an architect and a builder is not yet sufficiently defined. It will be said, and truly, that you cannot teach a man to design,—that it is a gift; but it is a power assisted very much by education and training, and it is only just to the profession at large that this education and training should be possessed by all those ambitious to join its ranks, and thereby put it on a level with other professions. If the want of any regular training for the artist in the higher walks of life is so apparent, what shall I say of the system adopted at our schools of art? I believe a considerable number of pupils have learned to draw in them, and I feel certain they deserve a large amount of credit for what they have done; but there is, I fear, a great absence of observation or investigation in the education provided: the effort appears to be more to realise an elaborate drawing. We

want spirit and life in drawing of the different forms, not a painfully over-studied drawing. Then I fear also the pupils do not sufficiently understand what they are copying, and a large amount of interest is removed from their work. Let us have vigorous and intelligent treatment rather than mere mechanical precision.

The study of painting, sculpture, and drawing forms a most important part of an architect's education, and it will be for the members of the Association to show by their co-operation and diligence their appreciation of this fact, when, I have no doubt, the Royal Hibernian Academy will be happy to afford all the assistance in its power to members who should seek admission to its halls.

You will perhaps say this is very hard work to go through, and you probably ask what is the reward for all this. I would say in reply that you are about to become members of a most honourable profession. It is an ancient profession, notwithstanding the efforts of those who try to prove that it did not exist in the Middle Ages, but that each workman designed his own part and depended on his devices. The examination of any of those buildings will at once convince you of the absurdity of such a statement, even if we had not actual evidence of the fact. It is an intellectual profession; for, though we know cases unfortunately that would prove the reverse, they are, I am happy to say, the exceptions, and the high standard of Vitruvius is that aimed at, I am sure, by those who approach it as they ought. It is also a profession that can confer the greatest honour on its members, for I believe no matter under what discouraging circumstances you begin, if you only work diligently you shall win your way, you shall gain the respect and esteem of others, and, even though you should fail, you shall have the reward of your own consciences that you traversed the right path.

ON SHADOW.

Pursuing the observations on the subject of shadow, commenced in our last issue,* it may be noted that with regard to the attention paid by the Greek artists to the point of view, there can be no doubt. The anecdote of the competition of Phidias and Alcamenes is well known. Two statues, by these two artists, were exposed to the public, *unplaced*, at the same time. The verdict was altogether in favour of Alcamenes. But on the next day, the statues were raised to their destined elevation above the observers. Then every voice was raised for Phidias. His rival was nowhere. We may observe this mode of treatment for ourselves, in the Elgin and Greco-Roman marbles at the British Museum. The thigh of one of the magnificent draped figures representing the Fates, who was seated in the pediment of the Parthenon, is altogether out of proportion as viewed by the spectator on the level. The head of an Apollo, which is dignity itself when viewed at a proper angle, recalls the account of the physiognomy of Titus Oates (whose mouth was said to occupy the centre of his face) as seen on the pillar where it is actually gibbeted in the gallery.

With regard to the art of Egypt, so much older, and so much more long-lived, than that of Greece, there is not the same reason for believing that the sculptors paid great regard to securing a fixed illumination. In their temples, indeed, the Egyptians knew how to take advantage of the effect of shadow, as they did also of the laws of perspective. They at times increased the apparent length of a vista, by the introduction of a false perspective, or an unnatural diminution of size, that gave the effect of increased distance. How far artificial illumination formed a part of their rites we are only partially aware. But in Egypt, shadow is so dense—mighty—palpable—that it cannot be played with as it can in Greece and in Italy, during the time when people can work in those countries. In the months when a vertical sun sheds a semi-tropical ray, no one *does* work there, or work, at least, in the heat of the day. The summer was the seed-time of Greek art. Then by shady stream, or dark cliff overhanging the blue sea and golden sand, as on the more public occasions of the great sacred games, the artist caught those glimpses of the unclothed form, in its natural grace of proportion and elegance of motion, which were reproduced in his finest works. Sculpture, in a country that has no summer, or has only what English people call a summer, must be a starved and stinted art.

* See p. 797, *ante*.

But in Egypt, heat and shade are too decided either to allow of such instruction to the artist, or to teach him to deal with shadow as his great *organon*. Colossal magnitude was the grand means by which the Egyptian sculptors sought to affect the imagination. Shadow, indeed, there was, vast and pronounced, as that which the mighty figures of Memnon and his companion cast for furlongs over the sands. But it was a shadow like that of a rock; not like the dancing network of shade thrown by a forest. At the same time, in those magnificent portrait statues which, as portraits, vie even with the excellence of this branch of Roman art, while, as massive monuments, they are worthy of note even in the land of the Pyramids, we have the effect of the natural illumination under which men ordinarily live and move. The Egyptian artist has not enslaved shadow as his workman, but he has never, like modern workers, allowed it to distort and deface his work.

To the student of more recent art, the magical effects which Michelangelo knew how to produce by the disposal of shadow, will at once occur. It is the finest characteristic of his sculpture. It consists with the gloomy, grand, stormy, aspect of his mind. In the Medicean Chapel, the vast forms of day and night, of morning and evening twilight, seem almost spirtual and unsubstantial, from the well-directed shade. And to the central figure of the whole wonderful mausoleum, the seated form of Lorenzo de' Medici, the shadow of his helmet gives a ghastly life that seems to have stepped back from beyond the tomb.

In such a work as the Medicean Chapel, however, the sculptor disposed of the appliances of the architect. Thus in the brooding figure beneath the casque, we have more than sculptural shadow, we have pictorial shade. Something of the magic of aërial perspective is cast over the pensive face; and we seem not so much in the presence of a statue as of a ghost. Wonderfully powerful as is the effect, it is due to a combination of causes, in which, it is true, definite illumination holds the first rank. But the difference between those sharp shadows which define form, of which we have been speaking, and the diffused shade that obscures it, is marked. In the mouth of Mrs. Nightingale, in the monument by Roubiliac in Westminster Abbey, and again in that of the Newton, by the same sculptor, at Cambridge, the effect of a definite, contained, shadow is most remarkable. The study of these very different monuments brings into strong relief the difference between shadow and shade.

We have recently had occasion to remark how one of the main defects of a photographic portrait is the deep black stain, into which the shadow of the upper lip is converted, by the camera. It must be remarked that this is not the sculptor's shadow,—that cast within the parting of the lips,—which is, in itself, of extreme physiognomical importance, as defining that tell-tale trait, the outline of the lip itself. It is a shade thrown not by, but on, the lip, and tends not to intensify, but to obliterate expression. So marked is this unfortunate peculiarity of the portraiture effected by the camera (when reduction is employed) that in some of those shadowy half-defined figures, by which certain photographers, in this country and in America, have pretended to limn the very features of the spirits of the departed, the black stain, which tells of light reflected from a solid body, and not of the nature of phosphorescent illumination, at once betrays the imposture.

In passing from shadow to shade, we pass from the province of sculpture to that of painting. We do not deny the command of either effect to the sculptor, any more than to the painter; but to each should be first assigned the mastery of his proper method. The shade, of which the sculptor avails himself, is that of nature. It is determined chiefly by locality; but the shadows by which he defines the sharpest and most delicate modulations of a relief or a statue, are the very characters of his art, and are due, in about equal proportions, to the true conditions of accentuation and illumination.

In shade, on the other hand, we approach the province of colour, and enter into a wide field of considerations that form an important chapter in the philosophy of art, but which are foreign to the art of the sculptor.

We referred to the shade cast by the cornices of the Parthenon, on the sculptured groups in the pediment. In dealing with shadow, as one of the main elements of the effect of architectural detail, the architect has to contend with the difficulty of the never-ceasing movement of the sun. The Greek architect learned how to meet that difficulty. He so sank and undercut the recessed members of his mouldings, that they caught a shadow at every angle of illumination, and brought out the delicate details of their workmanship, by deep lines of shade, ruled by the sun, from whichever direction his rays were incident. This is a very instructive and a very beautiful contrast to the mode in which shadow is dealt with by sculptors. In ever varying illumination, the architect gives deep hollows that must ever contain shade. The sculptor, for a fixed incidence of light, produces the most beautiful effects by delicate traits, that would escape the eye if the incidence were altered. Each artist deals with shadow as a most effective element of beauty; but each deals with it in the manner special and proper to his art.

"THE COMPLETION OF ST. PAUL'S."

The October Number of *The Quarterly Review* contains an article under this head which will excite much anger. Written possibly by more than one hand, it includes truth and falsehood, justice and injustice. In abuse of modern English architects, it even outdoes a recent article in the same journal; and so, from the want of qualification and discrimination, overshoots its mark. In respect of the present system of art-manufacture and the destruction of individuality in the artist, the writer adopts the views we have set forth on several occasions. We may have occasion to return to the article, and in the meanwhile reprint its conclusion:—

"The Committee and the Dean and Chapter would be well advised to undertake first those works that would be most obvious and satisfactory to the greatest number, and at the same time most beneficial to the building; and if the exterior and interior are made properly approachable, and cleaned, and lighted, much will be gained for further operations. Then, secondly, the interior might be made suitable for the future work of the cathedral; and, thirdly, Wren's suggestions for the decoration of the dome and ceiling should respectfully be followed. The inlaid marble work is no affair of Wren's: it would be entirely inartistic, and worse than a waste of money. Were there no pilasters or 'Orders,' the plain walling might with propriety be decorated with a veneer of colour, a sort of large-patterned mosaic; but in St. Paul's the parti-coloured marble panels and pilasters would be a feeble imitation of the low-bred extravagance displayed by the more disreputable Papal families at Rome. At St. Peter's, the marble work and gilding 'impart a fuller idea of sumptuousness' than Wren ever thought of for St. Paul's, and make the interior look like a splendid vestibule for a huge palace. It is not simple but 'imposing,' and addresses itself to the low and worldly rather than to the more lofty and pure-minded portion of mankind. St. Paul's wants light more than colour, and the effect of coloured marbles would be to damage rather than to glorify the church. Some slight panelling of colour might, perhaps, with great care be introduced; but the contrast between the piers and walling, and the rich but—emphatically—not heavy ceiling should be well maintained. The floor should be of marble; dark, to give solidity to the building, mixed with verd antique, that the cool colour may by contrast make the walls look warm, and highly polished to reflect the light. A building such as this requires different treatment from the choir at Chichester. The stained glass, home and foreign, at St. Paul's is of various qualities and styles, but all alike abominable, and should be promptly sold to any bidder. We would advise advertisements to speculating builders. This glass is another evidence of the absurdity of entrusting decorative work to distant manufacturers. The workmanship and material of Munich glass are excellent, but its principle is all erroneous, and its use entirely without appropriateness or artistic sense. We find stained glass used daily throughout England and the Continent, without the least regard for decency or fitness, till our churches have expressive rivals in the class of showily-dressed women, or disreputable-looking and bedizened scullery-maids. St. Paul's wants no stained glass: it has no 'storied windows.' The 'dim religious light' does very well as a poetic phrase, but it is nothing more. Windows were evidently *storied*, that in spite of all the 'richness' the light might *not* be dim. King's College Chapel is light enough, but, we apprehend, not therefore irreligious. Wren did not design St. Paul's for

stained glass, and if Wren's intentions are to be regarded, then stained glass is out of the question. The building is entirely unsuited for it, and it for the building. The present light is insufficient, and all that can be gained will not be more than enough. The walls are thick, and the piers large and obstructive, so that the windows are not obvious at a glance, but are only visible in small groups, or one by one. Thus there can be no general effect of colour from the windows in conjunction with ample light, as in a Gothic building like the Chapel at 'King's,' but only a very stupid obscuration, with no religion in it, and some isolated and entirely incongruous patches of colour. Great men are not always wise, and can afford to learn: let the Committee remember St. Michael's, Cornhill. The glass, then, should be white, as at St. Peter's, or very slightly flecked with colour, to neutralise the dirty tone of atmosphere and light; the glazing delicately fine, with narrow bars, but the panes not large, in order to avoid the drawing-room effect of modern churches of the Italian style. Then all the childishness and fanciful profanity that assumes the name of 'Christian Art' should be quite cleared away, and carefully excluded from the church. We need not spend our time upon 'Te Deum' puzzles, or make playthings of the 'emblems of the Passion,' and then, like the 'Worcester' Chapel critic, become 'impressed' by them, or seriously play the fool with all the Calendar. No man of any genius or power would degrade himself by taking any part in any 'ecclesiastical' imposture, or so deliberately trifle with the childish public. That was not Giotti's way, nor Buonarotti's. Their art was certainly not 'ecclesiastical,' but manly, dignified, progressive, original, and true, and also appropriate to the 'Sistine' and 'Arena' chapels; where no stained glass obscures the necessary light, and there are no obtrusive 'Orders,' but the paintings are the decoration of the buildings. When we produce a Giotto or Massaccio, and have sufficient knowledge and artistic sense to find him out, by all means let us seize him, shut him up in the cathedral, cut away all the 'Orders,' Wren notwithstanding, and let him glorify the building in a way not 'ecclesiastical,' but human and divine,—a way that Wren himself had no conception of. Such men may be, perhaps, found when they are really wanted, but not certainly until we have considerably got beyond the people who call tenth-rate 'architects' and decorators men of eminence, or who declare that the 'ecclesiastical element' is wanted at St. Paul's. It is remarkable that at this stage of architectural depravity we should be unable to supplement its weakness by any other art. The figure carvings at St. Paul's do not afford us hope; they are, in fact, a group of national 'ex-votos,' with all the hideous deformity and bad taste that are the special characteristics of such 'thankful' and 'memorial' displays; and of the paintings that were shown this year, the most attractive seemed to be those that exhibited the ablest combination of man-millinery with knack and greed; but of the dignity and power of mind that indicate the master, and would be worthy to adorn a Christian church, not the least evidence.

The duty of the Committee is certainly a difficult one. They have to satisfy the public, whose intense ignorance must be beguiled by some name with which they may have that familiarity which is a substitute for confidence, and they have unfortunately taken to voting. Of course, there must be two parties, and those who are best informed will perhaps, when judgments differ, be most decided in their views and advocacy, so that the wavering balance of decision remains with the less instructed or determined men. We are stating now the rule without any reference to the actual fact in the present case. But we may ask the several members of the Committee whether they are each of them ready to undertake the responsibility of a decision; or, putting the question less *ad hominem*, whether they are prepared to intrust it to any other member? for, after this voting method, St. Paul's may at any time be at the mercy of some gentleman whose opinion on the subject in question may be entirely valueless. In such cases, the result is almost always a misfortune; and then all blandly admit that, though there is a public injury, it is done in the most excellent and equitable way, 'and that, after all, is the principal thing.' Trial by jury is the British nostrum, but the true specific is the judge, the learned and life-long practitioner of the law, and he directs the jury; he is not a mere copyist or transcriber of old forms, but has personally practised long, a thorough working man, under the supervision of accomplished able men,—not *connoisseurs*, with anxious clients and astute attorneys, not a dull public or spasmodic clergy, looking on. So when the Dean tells us that 'we can judge' on Mr. Burges producing his designs, we must respectfully demur. There may be a decision, as is the manner of committees, anticipating or avoiding judgment; and this is headlong folly. But 'wisdom dwells with prudence to find out knowledge of skilful plans,' and the true method of such wisdom is not difficult to find. Let us listen to 'Socrates':—'When the assembly meets to elect a physician or a shipwright, or any other craftsman (artist), will the rhetorician (cleric or *connoisseur*) be taken into counsel? Surely not. For at every election he ought to be chosen who has the greatest skill; and again when walls have to be built, [or harbours or docks to be constructed, not the rhetorician, but the *master workman* will advise.'* The Master of Balliol has not overlooked the value of the word *αρχιτέκτονες*, 'master workmen,'—not 'architects,' as we call our drawing-masters, who are not master workmen at all. So here we find that the Greeks, avoiding the rhetoricians (committee-men), went direct to the craftsmen whose work Mr. Burges has actually 'studied at Athens.' Let the St. Paul's Committee also go to the 'master workman,' and leave Mr. Burges to resume his studies at Athens.

Then, with reference to the qualifications of those entrusted with great public works, again let us hear 'Socrates':—'Well, then, if you and I, Callicles, were engaged in the administration of political affairs, and were advising one another to undertake some public work, such as walls, docks, or *temples of the largest size*,—ought we not to examine ourselves, first, as to whether we know or do not know the art of building, and who taught us? Would not that be necessary, Callicles?' *Cal.* (and the St. Paul's Committee). 'True.' *Soc.* 'In the second place, we should have to consider whether we have constructed any private house, either of our own or for our friends, and whether this building was a success or not. And if upon consideration we found that we had had good and eminent masters, and had been successful in building, not only with their assistance, but without them by our own unaided skill, in that case prudence would not dissuade us from proceeding to the construction of public works. But if we had no master to show, and no building, or many which were of no worth, then surely it would be ridiculous in us to attempt public works, or to advise one another to undertake them. Is not this true?' *Cal.* (and the Committee of St. Paul's). 'Certainly.'†

One word more for ourselves: 'And now by the god of friendship, I must beg you, Callicles, not to jest, or to imagine that I am jesting, with you; for you will observe that we are arguing about the way of human life, and what can be more serious than this to a man that has any sense at all?'"

* Plato: 'Gorgias,' p. 455 B.
† Ibid., p. 514 A–D.

DISTRICT SURVEYORS AND RUINOUS BUILDINGS.

At the meeting of the Metropolitan Board of Works held last week, a discussion ensued as to the fees allowed to district surveyors in respect of dangerous buildings.

Mr. Newton said, a widow in his parish called upon him and stated that she had been asked to pay 1*l.* 15s. in respect of two houses which were reported to be dangerous, and that by an expenditure of 12s. on each she had put those dangerous structures into a condition that was satisfactory to the officers of the Board. He gave this as her statement, without vouching for the correctness of it; but if this went on, the Board need not wonder that there were serious complaints of the extortionate claims for fees. He thought it should be referred to the Building Act or some other committee to see whether the matter should remain in the hands of the district surveyors.

Mr. Richardson is reported to have said he was not at all surprised at the remarks Mr. Newton had made, because there were many cases of the same kind, yet it was impossible to prevent them. When a surveyor examined premises to see whether they were dangerous, he charged 10s. 6d. for his visit, and if there were two houses together, he charged 10s. 6d. for each house. There were instances of an examination being made of a coping where there were five houses together, and he had 10s. 6d. from each house, although there was only one visit. Then, if the parties did not immediately attend to the notice sent them that the structure was dangerous, fresh charges came upon them. The surveyor went to see whether the work was done, and there was another half-guinea. He had known cases in which, although the repair had not cost 5s., a man had been obliged to pay 35s. for fees, owing, in a great measure, to his own neglect. The smallest charge, he thought, was 15s. 6d., the charge of the surveyor, and 5s. for office expenses, although that 15s. 6d. might not cost the party 2s. 6d. in repairs. He did not know whether this arose from the Act of Parliament or from some bye-law of the Board.

The last speaker, if correctly reported, is in error in saying the district surveyor *charges* 10s. 6d. for a visit. He makes no charge at all in such cases,—has no control over the charge,—but simply accepts whatever fee the Metropolitan Board in each separate matter awards him. In most cases these prove far from remunerative. The district surveyors often spend much time in endeavours to induce owners to repair dangerous structures without invoking the interference of the Board, and nearly as often without effect. The widow's case mentioned by Mr. Newton by no means proves overcharge on the part of the Board. The amount of costs has no relation whatever to the extent of the work required to be done to protect the public. To obtain the removal of a dozen loose bricks, the fall of which would kill a man if he happened to be in the right place, might entail costs to the extent of say 30s. The fact that the bricks might be removed for 5s. would be no proof that the costs were excessive. The possible value of the man saved would have to be considered.

CHURCH ARCHITECTURE AT THE CHURCH CONGRESS.

During the recent Congress at Leeds an evening meeting in the Theatre of the Mechanics' Institution was devoted to the consideration of church architecture, when two papers were read. The first was by

Mr. G. G. Scott, jun., who dwelt chiefly on the desirability of building larger churches than are now generally erected:—The churches they built in their towns, he said, were founded too generally on the type of the Mediæval village churches. They had the look of small designs done large; there seemed to be a want of dignity even where the scale would admit of it. Several causes contributed to bring about this unsatisfactory state of things. The smallness of their ancient churches was due, no doubt, to the fact that in the large towns there was, if not a cathedral, some great monastic church, to which the small churches were practically chapels of ease. Thus the smallness of their churches was due to tradition. He could not but think, although it was almost heresy to say so, that subdivision of parishes had been carried too far. They had pushed the parochial system to extremes. Everywhere they saw little churches, little parsonages, and little schools, where, to meet the wants of the day, large churches and numerous clergy were required. He did not think that among the causes of the present poor character of our churches was niggardliness. There was plenty of generosity, but it should be borne in mind that a district possessing many thousand souls needed corresponding adjustment. If a church was viewed as God's house, and was erected for a high purpose, it never failed to meet with support. It was bad policy to content themselves with such small buildings as they were now in the habit of erecting. If the object was to provide private places, where respectable people might pay their Sunday tribute to propriety, well and good; but he maintained that such a building partook of the character of a semi-detached villa. If the poor and the artizans of our land were to be considered they would provide a totally different kind of building. Men and women of different classes of society would never meet in any church which lacked accommodation or plenty of elbow-room. In foreign churches the poor and rich worshipped together, simply because the buildings were large enough. It was only in large buildings that persons of all classes could be brought together with mutual satisfaction. Small churches would always be monopolised by the respectable classes. In

foreign churches this monopoly did not exist. The churches there were essentially public places of worship, and until this feeling extended to our own churches our national churches would never be the churches of the nation. He was not asking for the erection of grand and stately buildings of Mediæval architecture, but that their churches should be on the scale of their factories, town-halls, and railway stations. He believed they would have no difficulty in erecting churches imposing from their size alone. A large parish, with a large church and a numerous staff of clergy, fed by mission chapels, would be far more efficient than the present system. It should specially be kept in view that the interior of a church was of more importance than the exterior. The exterior was sure to give a certain dignity from its dimensions. The Roman Catholic Cathedral at Birmingham was a building in point, harmonising and yet contrasting with the surrounding buildings. It was essential that they should economise in the erection of their churches. This could be done to a great extent by having little street frontage, a plan pursued very generally in erecting Italian churches. In other cases the tower of the church might stand to the street front, with the church behind; and by this plan funds otherwise spent in acquiring an available street frontage could be used for purposes of general dimensions. They should not, in the planning of their churches, blindly follow Mediæval precedents, but consider their own requirements. The whole area of nave, transepts, aisles, and chantry chapels, filled with pews, presented to his mind a most unsatisfactory effect. Their wants were not the same as their forefathers'. They must look less to the form and more to the principles, and not produce buildings which might have been built for the Middle Ages, but which the builders of the Middle Ages might have built for the present day. What they needed was large space, where all might see and hear when in the church. Whilst on the subject of plan, he might observe that the chancel arches might be dispensed with, and it would be better to fence off the choir with screens.

Mr. J. P. Seddon, in the course of a paper read by him, said:—The standpoint that we have attained is, a fair acquaintance with the spirit of Gothic, as well as a tolerable familiarity with its details; we have, in fact, learned to read and spell in it; and the question now is, how, as authors, we ought to say that which is to be said in each particular case. Hitherto, it must be owned, we have been too much of copyists after the Chinese fashion, imitating even flaws. Our models having become reduced to mere empty shells, shorn of furniture and decoration, we have taken their poverty for purity, and their bareness for purposed design. If we would sum up what has been effected, allowing for exceptions, we have built a multitude of churches, the vast majority of which would be best described in the language of passports, as having naves ordinary, aisles ordinary, chancels ordinary, towers and spires most ordinary, and so on. We reckon up the capitals carved after every plant in the hedgerows, the windows dyed with all the tints both in and out of the rainbow, the marble shafts to pulpit and fonts, and the number of yards of encaustic pavement, as if a collection of things indifferent could make a satisfactory whole. Perhaps till we learn to measure art by merit, and not by superficies, it is as well that our church interiors have bare walls and some plain glazing left. But it is sad to reflect that these many years of church building and restoration have done so little towards raising up a school of decorative artists, that art-workmen generally are a myth, and that an expenditure of millions has not given us as many works of real high art in our churches as might be counted on one's fingers. Now that funds are forthcoming for the decoration of St. Paul's Cathedral, a difficulty arises in finding hands to execute it, since our many able painters have, from sheer want of encouragement, devoted all their energies to another branch of their art, which seems absolutely to unfit them for this. It would, in speaking thus, be unjust not to mention the isolated examples of artists of high eminence who have lent their great talents to this decorative work with more or less success,—such as Mr. L'Estrange and Mr. Gambier Parry for the roof of Ely Cathedral; Dante Gabriel Rossetti for the reredos of Llandaff Cathedral; and in connexion with E. Burne Jones and Ford Madox Brown, on the able glass paintings of the firm of Messrs. Morris, Marshall, & Co., Mr. Leighton at Lyndhurst Church, and Messrs. Watts and Cave Thomas, &c., elsewhere. Turning now as I must to the few experiments my limited opportunities have afforded me to put principles into practice, with painful consciousness of their openness to criticism, I proceed to explain what those principles are. In the first place, much greater scale than usual seems needed for churches in large towns. It would be cheaper to build a few of noble size than many inferior ones, and the former would be far more impressive. If churches are to maintain dignity as compared with secular buildings, they want greater height, having to stand amid many-storied houses. As to area, too, they are now very much pinched, and the sight of a congregation issuing in rain, donning cloaks and unfurling umbrellas while hustled in a crowd, is ignominious. What it would be in case of fire may be conceived. Ample space in the approach, as common in German churches, would be both a useful and dignified addition. Within doors it would be well that there should be room, beyond what is occupied for seats and necessary for passages. Vestries for clergy and choir should not be mere closets; and if at the western end, instead of, as usual, at the east, a more direct and wider processional path would be obtained. A different arrangement of plan, consequent upon change of ritual, seems desirable in town and large churches, though, perhaps, for small country ones there is no such need. The division into nave and aisles has lost its original use and significance, and the columns it entails cause inconvenience to many in a large congregation. The desirability that as many as possible should see the single altar, and that all should hear both service and sermon, calls for altered treatment of the body of such churches. I assume that the entire accommodation is on the ground floor; for, although galleries could be treated, as in many German churches, with excellent architectural effect, they are quite inadmissible, as opposed to the proper ideal of Anglican worship. There are, however, limits to the size of the single unobstructed hall that would best meet the demand. Its width calls for corresponding height, for the sake of proportion. This is a desideratum to towns, but costly, and, as economy has usually to be studied, it would necessitate sacrifice of other features and in character of material. Brick, however, may well be used for stone and ornament eschewed to gain that effect which scale alone can achieve. One rule of the Incorporated Church Building Society, which restricts the width of naves to about 24 ft., would have to be honoured rather in the breach than the observance. It has recently been waived at my application. Modern science and appliances may well be called upon to do what has been done before, and precedents, if needed, are not far to seek. * * * I can only touch further upon a few points connected with the treatment of such buildings as instances in which the last suggestion may be carried out. Instead of making nave and chancel separate, and each too short for effect, one continuous roof covering both is preferable, and the very considerable sum that the arch and wall of division would cost would be far more effectively spent upon an open screen, which might bear paintings, such as render many ancient ones in Norfolk rich treasures of art. Towers and spires,—weaknesses of the age, without which no committee would think the most ordinary class of church complete,—were better omitted, unless worthier far than scores or so of the numbers that have been erected, and to compass which most modern churches have been starved in other respects. Built usually as mere ornaments, irrespective of bells, a good peal of which would rock one-half into ruins, they hardly rise above the adjoining roofs, and do not generally even clear the structure to which they are attached, so as, like old ones, to send forth, all around, the music of their bells. Let us have towers and spires, too, when they can be really fine ones, and well furnished with good bells: otherwise, let us be content with more modest turrets, the best of their respective kinds. Within the walls, in place of profusion of indifferent ornaments, let each church be the shrine of some one jewel of art, at least, that it might thus be worth the pilgrimage of those who now must seek such abroad,—not that churches should be turned into mere picture-galleries or museums. I wish that they were made less so than they are by the enterprising so-called art-manufacturers of the day; but they were once the Bibles of the poor, and their influence as such was great. It is a mistake to think that this office of theirs has been superseded, although we have now the written Scriptures in every hand. The church should make use of all means of driving home to the hearts of men the great truths it is commissioned to preach, and in art it might still find a most able assistant. But the art I mean is not the architectural millinery which is now too often made to stand duty as for such. To be plain, the general conception of church decoration of the present day is an erroneous one; and we have often reason to be thankful for the prudery which makes it a sin to look at it when we are assembled for prayers, and for the beadledom which prevents our doing so afterwards. Scant minutes only are fortunately allowed adventurous strangers, at the close of service, to peep through the chancel screen, if there be no distinction in design between the finery of tiles in the reredos and on the floor, and if it be but the gloss of mosaic that has been substituted for the former. The decoration of the church should be other than we usually find it. If its children ask for artistic bread, it is hard to give them fantastic diagrams of coloured stone instead. A better intellectual feast is needed than a bizarre medley of coloured bricks, or even a few panels of carving with figures of the size and with the expression of dolls, and smothered amid crocketed canopies, supported on twisted columns, and studded with agate balls. If our church-doors were not shut out of service time, what valuable aids to education might not their walls be made! We blame the poor for dulness of apprehension, but do little to enlighten them. Our own houses are closed to them, and the art provided for their cottages is but pet dogs and bad lithographs. Suppose, however, our churches were common withdrawing-rooms, stored with works of sacred art, leaving the secular to grace museums, such might be studied as no pictures now are without the distraction caused by other objects competing with them for attention, and in peace and quietness. Surely here is an element of influence well worth cultivation. Donors would be more ready to give, and more careful as to what they gave, if they thought that their gifts would be looked at with other than sidelong repented glances. A higher style of art would be encouraged than the *tableaux de genre* which artists are now doomed to paint, since private houses alone receive their works. Art would be appreciated more than now when it can only be seen in monster collections, where the gilt frames jostle each other, and spectators are dazed by the crowd of incongruous objects; and people would find out that it had a tale to tell, and that that should be both worth telling and worthily told the church could and should ensure.

NEW SCHOOL BUILDINGS IN HOLBORN.

A spacious block of school buildings has just been erected close to Red Lion-square, Holborn, which are in connexion with the intended new church of St. John the Evangelist, about to be built in the immediate neighbourhood. The new schools, which will be completed and opened in about a fortnight, are situated at the corner of Kingsgate-street and Fisher-street, close to Kingsgate-street Baptist Chapel, with entrances from each of the two streets named. The Kingsgate-street frontage is 72 ft. in length, and the depth into Fisher-street is about 40 ft. The height of the building from the street-level to the cornice is 48 ft., the roof being carried up to an additional height of 14 ft.; and over the roof there is a belfry. The structure is built of yellow stock brick, with red brick and stone dressings, red brick bands being carried along the building at the bottom of the first and second story windows. The ground-floor and first story in Kingsgate-street have very lofty windows, three of those in each of the stories being double, whilst those at the south end are triplets. The windows in the Fisher-street frontage are similar in form. The second-story windows are also double and triplet, but oblong in form. The building contains three spacious school-rooms, with two class-rooms to each. They are 15 ft. in height, and, including the class-rooms, 68 ft. in length, and about 36 ft. in width. The ground-floor is intended for an infants' school, and the first and second floors for girls and boys respectively. The estimated cost of the schools is a little more than 4,000*l.*, which has in part been supplied through a Government grant, the remaining portion having been raised by subscription. Messrs. Young & Tasker, of Furnival's Inn, are the architects, and Messrs. Henning & Son, of Chiswick, the contractors.

THE DAVY MONUMENT.

A memorial of Sir Humphry Davy, erected in Penzance, opposite the Post and Telegraph offices, has been unveiled by the mayor.

The pedestal rests on a base of unwrought granite, 10 ft. square, consisting of four blocks, each weighing over 8 tons. The pedestal itself is of blue Lamorna granite. The sub-plinth consists of one block, 8 ft. square, 2 ft. 6 in. high, and weighs over 11 tons.

The plinth is of one block, 5 ft. 4 in. square, by 2 ft. 4 in. high, and weighs 5 tons. On this is placed the die, one stone, 4 ft. square, 5 ft. high, in the centre of the front face of which the name of the great Cornishman, Davy, is cut in relief. This is surmounted by the cornice, formed of one stone, 5 ft. 6 in. square, 10 in. thick.

The mouldings of the cornice are finely cut, and show the capabilities of the Cornish granite to receive delicate work. On the cornice rest two blocks to receive the figure. The weight of the base and pedestal is about 60 tons.

The statue of Davy is well executed. One of the most useful works of his valuable life is symbolised by a model of the safety-lamp, which he holds in his right hand. The figure is 8 ft. 6 in. high.

The erection of this monument is mainly due to the energy and perseverance of some working men of Penzance, conspicuous amongst whom is Mr. John May, who for many years has devoted himself to its accomplishment.

The sculptors are Messrs. W. & T. Wills, of London; the contractors, Messrs. Freeman & Sons, of Penzance and Penryn; and the architects, Messrs. Trounson & Son, of Penzance.

THE CORNWALL MINERAL RAILWAY.

Sir Samuel Morton Peto, the contractor for the Cornwall Mineral Railway, is giving employment to several hundreds of artizans, and last week he advertised for an additional number. It appears that there is now great activity on this and other mineral railway works now in progress in Cornwall, and that for the next eighteen months there will be constant employment for a large number of artizans on twenty-seven miles of new work, and twenty miles of rebuilding, on the Cornwall Mineral Railways, the principal works on which are now in hand. The construction of the Lidford section of the Devon and Cornwall Railway works is one of the works in progress.

CAMBRIDGE HALL, SOUTHPORT.

The foundation-stone of the new building to be named Cambridge Hall has been laid by the Princess Mary of Cambridge, who was accompanied by her husband, the Prince of Teck.

The new structure is in immediate contiguity to the old town-hall, and will, when completed, add materially to the convenience of the town and corporation. The design was submitted to public competition, and the prize of fifty guineas was ultimately awarded to Messrs. Maxwell & Tuke. In an architectural point of view the building, according to the design chosen, will be treated in the Free Italian style, but it is intended to subject the drawing which has been in circulation to considerable alteration. One-half of the ground-floor will be devoted to a new post-office. The remainder of the lower story will consist of two large dining-rooms and various retiring apartments. Upstairs will be the new assembly-room, designed to accommodate 1,500 people, and to supply a want which has long been felt in this fashionable place of resort. Externally the structure is to have a colonnaded front, and over that a balcony ranging along the entire extent of a carriage-porch beneath. The present assembly-room is only capable of accommodating from 500 to 600 people, and the advantages of the new hall, of more extensive proportions, combined with increased post-office accommodation, are recognised in Southport as matter of public congratulation. The estimated cost of the building is 40,000*l*.

After the laying of the foundation stone, a banquet was given at the townhall.

In the mayor's address to the Prince and Princess, at the laying of the stone, he said, in reference to Southport;—The pier they would see that day was open to the public, and was built at a cost of from 40,000*l*. to 50,000*l*. They were now extending the promenade, so that there should be a carriage-way which could not be excelled in any other part of the kingdom. They had an asphalte drive reaching for nearly eight miles in the borough and in Birkdale. The improvements in the town had also been extended; they had new boulevards and other works which would enhance the beauty of the place, and they hoped would increase the number of people who came to enjoy the salubrious air of this healthy part of Lancashire. They had a park second to none in the country, extending over thirty acres, which was presented to them by their worthy rector. A system of tramways was about to be laid down at a cost of about 20,000*l*. The gas-works were about to be removed two miles from the town, so that they might have neither smoke, smell, nor anything which could annoy any one. In the midst of all this their town was prospering. Last, but not least, it was proposed to form a winter garden for the aged and invalid, at a cost of some 50,000*l*., and nothing smaller than the Crystal Palace would approach it. There was excellent accommodation for travellers, and excellent accommodation in the shape of churches and chapels. Southport is evidently moving.

OPENING ST. PAUL'S CHURCHYARD.

According to the daily papers it is now arranged that the dwarf wall of stone which surrounds the cathedral facing Ludgate-hill, with the iron railings with which it is crowned, shall be removed as far as the north-west and south-west corners of the fabric itself, and that the entire area or courtyard, in the centre of which stands the statue of Queen Anne, shall be thrown open to the bottom of the steps which lead up to the great western door. These steps will be newly faced or cased, and nearly on the lowest step will be an iron railing, which will not be seen at all by day, but will be raised up at night-fall by machinery somewhat analogous to that now used for raising iron window-shutters from below. This change has been conclusively arranged in consideration of a money payment from the City to the Cathedral body. We hope this statement is correct. When the matter was discussed by the late Dean and a committee of advice from the Royal Institute of Architects, the boundary talked of was a little west of the statue. We have our fears about the winding-up machinery; but the arrangement is in perfectly good hands, and will doubtless come right.

EFFECT OF LIGHT ON GLASS.

That the colour of glass is affected by long exposure to light is well known: the violet tinge which the window-panes in some of the older houses in London have assumed has been often commented on.

At the last meeting of the British Association, Mr. Gaffield, an American, brought forward the results of a long course of experiments, extending over a period of nine years, and embracing eighty different kinds of glass, of English, American, French, Belgian, and German manufacture, of rough and polished plate, crown, and sheet window-glass, of flint and crown optical glass, of coloured pot-metal, and of flashed and stained glass of various colours. The changes in the colourless glass were from white to yellow, from a greenish colour to a yellowish green, from brownish yellow to purple, from greenish white to bluish white, and from bluish white to a darker blue. By the colours of colourless glass was meant those faint tinges of colour that were seen by looking through the edges of the glass. In his first experiments of a few months, Mr. Gaffield found only a slight change in a specimen of purple pot-metal. A subsequent experiment, continued for five years with red, yellow, blue, and purple glass, produced no change in any pot-metal except purple. A change was observed in the colourless body of some of the flashed and stained specimens; a yellow or purple tint was produced when the colourless body was uppermost, and also when the coloured surface met the sun's rays, and transmitted them at different degrees to the colourless body beneath. Among the changes that took place, glass of an amber colour became of a rose tint. As glass of this latter kind was used in the painted glass windows of the past ages, this series of experiments may be considered as an important aid in solving the question of the alleged superiority of the old cathedral window glass, which it is not improbable has been much modified in respect of tint by the sun acting on it for centuries. A curious fact was mentioned in connexion with this discoloration of glass, namely, that no matter how deeply it became stained or discoloured by light, it can be restored to its original colour by being exposed to the heat of the glass-stainer's kiln for a short time. The cause of the change is thought to be found in the peroxide of manganese, long used as an ingredient in glass-making.

RAMSGATE.

The sewering of this favourite watering-place is now being actively pushed forward, with the view of having the whole town sewered before the influx of visitors next year. The storm waters are being carried by a separate system into a tunnel, 5 ft. 9 in. diameter, the outfall of which is under the West Cliff. This separation has been adopted to prevent the recurrence of the inundation which took place last July, when the main streets of the town were 1 ft. deep in water. A new sea-wall, for the protection of the West Cliff promenade, is nearly completed. These works are being carried out by Mr. E. Ellice-Clark.

BELFAST ARCHITECTURAL ASSOCIATION.

On the 14th inst., a meeting was held in Messrs. Young & Mackenzie's office, Calender-street, for the purpose of forming an architectural association for Belfast. Mr. John Lanyon, architect, occupied the chair. There was a large attendance of those connected with the profession.

Resolutions were unanimously passed approving of the formation of such a society, and a committee was appointed, with Mr. R. Young, jun., as secretary, for the purpose of framing a set of rules and arranging for future meetings.

Much interest was evinced by those present in the objects of the association.

SCHOOL BOARDS.

Ipswich.—The Wherstead-road School Committee reported as follows:—"The committee having conferred with Mr. Butterworth, the architect, recommended that the tender of Messrs. Gibbons be accepted for the erection of schools in the Wherstead-road; that the contract be prepared by Mr. Butterworth; and that six months from the date of the notification of the acceptance of the tender be allowed to the builders, subject to an extension of time if the architect certifies that the delay is caused by weather; and that the plans and specifications be returned to the department with form No. 7 filled up for their confirmation." Considerable conversation followed, from which it appeared that Messrs. Gibbons had originally asked nine months for the completion of the building, and on being told that the Board considered it too long, urged that possibly the frost might prevent their working, and being under a penalty of 10*l*. for every week over the time allowed, they could not reduce the time. To meet this objection Mr. Butterworth, the architect, had drawn out a weather clause to insert in the contract. It provided that the walls should be finished in three months, the roof on in four months, and the buildings ready for occupation in six months, and that in the event of the work being delayed by inclement weather or frost, an extension of time should be granted. At the suggestion of Mr. Westhorpe, a provision was added that the architect should be the judge of whether or not the inclemency of the weather was sufficient to delay the work. Mr. Christopher Gibbons attended, and expressed, on behalf of his firm, his assent to the reduction of the time upon the insertion of the proposed weather clause; and also his assent to a similar provision with regard to the Argyle-street schools, as to which the committee reported as follows:—"The committee, having conferred with Mr. Eyton, the architect, recommend that the tender of Messrs. Gibbons & Co. for the erection of the Argyle schools, for the sum of 2,305*l*. be accepted, and that the contract be prepared by Mr. Eyton, and that six months from the date of the notification of the acceptance of the tender be allowed to the builders, subject to the same clause in regard to weather as in the Wherstead-road schools." The reports were each received and adopted.

The Chairman raised the question of the desirability of appointing a clerk of the works, as the Board would be building several schools, but at the suggestion of the Vice-Chairman the subject was deferred.

Nottingham.—A letter was read from the Education Department, by which the Department returned the plans for the alteration in the Bath-street schools. The Department considered that the arrangements in the boys' school were still unsatisfactory with regard to the desk and bench space. The document also stated that it would be desirable that the entrance to the school should be through the playground, and that the galleries and class-rooms should be placed at right angles with the windows. Messrs. Evans & Jolly, the architects, having been communicated with, wrote a letter to the effect that any further alterations would be injurious, and that an entrance to the playground would make it too much of a thoroughfare. The appearance of the building was improved by the present front.—Mr. Paget said the architects might have referred to the fact that it was not desirable to have an unnecessary expenditure of money.—Mr. Bentley said it was of very little use being careful over sixpence if you intended to spend 10,000*l.* at last.

Gateshead.—The tenders for the erection of the Prior-street schools had been received, there being twelve contractors for the whole work, and twenty-one contractors for separate portions of the work, the amounts ranging from 7,000*l.* to 8,900*l.* The sub-committee had considered the whole of the tenders, and recommended that the tender of Mr. John Harrison for 7,000*l.* be accepted. Mr. J. M. Redmayne moved that the committee's report be adopted, that the clerk apply to the Education Department to sanction it, and that steps be taken for the purpose of raising the money required.—The Chairman stated the entire cost would be 10,000*l.*, and in answer to Mr. France, said the last-mentioned sum would include the price of the land. The motion was unanimously carried.

Brierley Hill.—At an adjourned meeting of the Kingswinford School Board, the plans of Mr. Smith, of Stourbridge, architect, were chosen for the School Board school to be erected at Brierley Hill. Fifteen architects from various parts of the country submitted plans.

THE ANT NUISANCE.

Sir,—There is no remedy for the black ant, that I know of, at all comparable with powdered borax. I have often used this in America, where these insects are much more numerous and troublesome than in England, and they literally have always vanished. Once I have recommended it in England, and the result has been the same. Alfred Rimmer.

Taking up my last week's *Builder*, I find your inquiry respecting the getting rid of that disagreeable pest, the black ant, and having succeeded myself, would advise you simply to shake down a dusting of "chloride of lime," near and about the runs of the insect. This you will find will obtain for you the desired result.

M. M.

THE "ANGEL" IMPROVEMENTS, CLERKENWELL.

The scheme propounded by the Clerkenwell Vestry to enlarge the area at the "Angel" by removing the shops at the south corner of Goswell and City roads, which form a kind of neck to the City-road, and the whole cost to be paid out of the general rates, has virtually got the go-by from the Metropolitan Board of Works, who promise to take it along with a host of other mushroom schemes into consideration next July. The meaning of the resolution adopted by the Board is simply that the subject is shelved until Clerkenwell can undertake to pay half the cost, and then probably the superior Board will be prepared to treat with them, as the gain is wholly on one side. It would be a very desirable thing to widen the thoroughfare at that particular point, as both goods and passenger traffic are daily increasing, owing mainly to the rapid growth of Islington; but the difficulty is by no means insuperable, for if the tramway-cars and omnibuses be ordered to draw up beyond the narrow neck of road which does not extend more than 25 ft., no inconvenience will be felt, as the road suddenly widens, and is equal to all the traffic that passes during the day. The sewer committee of the Board of Works concurred in the opinion that a wider thoroughfare at that particular point was desirable; but it was so limited in extent, and the benefits to be derived from it being specially confined to one parish, they could not see their way to recommend it to be included in the list of metropolitan improvements. The vestry of Islington opposed the improvement, as being a metropolitan one, and refused to contribute towards it if adopted on payment of half the cost, on the ground that by the judicious arrangements of the two parishes the passenger traffic could be so diverted as to prevent delay in the transit of goods. Additional space will be given at that point by the removal of the Angel column clock in the course of next week, the vestry of Clerkenwell having ordered that it be taken away forthwith, so that every available inch of ground may be devoted to traffic. It may be urged, however, that the clock is a refuge in the midst of a crowded thoroughfare.

INCREASE OF HOUSES IN SOUTH LONDON.

An official return which has just been issued, and already referred to by us, shows the immense expansion of the several metropolitan parishes, as indicated by the great increase of inhabited houses, during the last twenty years, or since the formation of the Metropolitan Board of Works in 1851. In no part of the metropolis has the increase of houses more strikingly manifested itself than in some of the districts south of the Thames. The increase in the number of dwellings in Wandsworth during the period in question amounts to no less than 130·55 per cent., the present number of houses in that parish, as shown by the return, being 19,091. According to the same return Camberwell had 17,755 houses at the end of the last official year in 1871, or an increase of 88·63 per cent.; Lambeth, 29,123 houses, or 42·43 per cent. increase; Bermondsey, 10,624 houses, or 51·61 per cent. increase; Rotherhithe, 3,934 houses, or 40·90 per cent.; and Newington, 12,545 houses, or 18·32 per cent. increase. It will thus be seen that during the two decades Wandsworth has more than doubled the number of its inhabited houses, and that the dwellings in Camberwell have increased in number almost to the same extent. It is not a little remarkable that within the same period the houses have decreased in some of the parishes in the district, notably in St. Olave's, in which the houses are reduced to 1,764 in number, showing a decrease of 33·79 per cent.; St. Saviour's also shows a decrease amounting to 23·78 per cent., the number of houses in the parish being 3,716 only; whilst in Southwark, which has now 6,903 houses, there has been a slight falling off, the decrease being 1·01 per cent. Amongst the causes which have contributed to this decrease in the three last-named parishes, the probability is that the absorption of dwellings by the railway companies may be regarded as one.

HORTON LANE CHAPEL, BRADFORD.

This building has been closed for three months, to allow of a thorough cleansing and decoration. The work is now finished. The walls have been painted in a quiet maize, the pilasters and finishings of the windows in stone colour, relieved by maroon bands. The columns supporting the arched ceiling are in green bronze, with gold introduced in the ornaments. The great cornice which runs round the building at the springing of the ceiling arch has been treated in cream colour, with ornamental panels between the carved trusses in gold colour, and the broad groundwork of the frieze in maroon. The arched ceiling is divided into panels, with centre decorations in each; the stiles or divisions between the panels in cream colour, and the panels themselves in French grey. At the intersections of the ribs of the ceilings are large pendants, which are brought out in maroon and gold. The gallery front is panelled, and filled with iron ornamental work, brought out and gilded. The windows all round the chapel, both on the ground and gallery floors, have margins in red coloured glass, with a white scroll pattern cut upon them. The general woodwork throughout preserves the natural colour of the wood, and is varnished. The organ is in the centre of the chapel, in a large recess behind the pulpit, with pilasters at the sides and angles. The pipes have been diapered in gold and maroon upon a bronze-colour ground, and the woodwork relieved by maroon and gold. Considerable additions have been made in the heating power of the chapel, so as to bring it entirely under control, and preserve an equal temperature in all seasons.

The decoration has been carried out by Mr. Haley, under the direction of Messrs. Lockwood & Mawson, the architects of the building.

THE CHALLENGE-PRIZE OF THE NATIONAL MUSICAL UNION.

The challenge-prize of the National Musical Union, value 1,000*l.*, is now being manufactured by Messrs. Cox & Sons, of Southampton-street, Strand, who are making rapid progress with the work. The design was selected in open competition by Sir M. D. Wyatt and Professor E. J. Poynter, A.R.A., who acted as judges, and is by Mr. S. J. Nicholl, architect. It comprises a loving-cup, with a cover, resting on a platform and pedestal; the whole of silver-gilt, enriched with enamels, engravings, *repoussé*-work, pierced and filagree work; a very important part of the decoration being shields suspended in an open arcade, and fixed in panels, to bear the devices and title of the successful societies, the society holding the cup having the place of honour in the crowning wreath. The pedestal has canopied niches, with statues of Guido Aretino, Palestrina, Handel, and Mozart; the base being 18 in. square; the whole rising to over 3 ft. in height. The design is of Mediæval character. The following are the

INSCRIPTIONS:—

"Blest pair of sirens, pledges of heaven's joy,
Sphere-born, harmonious sisters,—Voice and Verse;
Wed your divine sounds, and mix'd power employ,
Dead things, with unbreathed sense, able to pierce."

"Praise God in His holiness; praise Him in the firmament of His power;
Praise Him in the sound of the trumpet;
Praise Him upon the lute and harp;
Praise Him in the symbols and dances; praise Him upon the strings and pipes:
Let everything that hath breath praise the Lord."

HINDOO TEMPLE IN LONDON.

Sir,—I was much interested at observing amongst your miscellanea, at p. 813, a note to the effect that subscriptions are being taken up at Bombay, for the purpose of erecting a Hindoo temple in London. At first sight, this information will doubtless appear startling to many, yet upon second thoughts, when we remember that the natives of India are our fellow-subjects, and that in accordance with the spirit of toleration which allows Christian churches to be erected in Hindustan, it is only fair that Hindoo temples may be erected in Britain. I trust the intended temple will soon be a reality; and when such is the case, it is possible that the present popular ideas anent the religion and worship of our Indian brethren will be considerably modified. W. P. Buchan.

A CHIMNEY-PIECE.

In designing the chimney-piece illustrated in the present number the desire of the architect was to harmonise the various coloured marbles used with the woodwork, so as to produce a rich effect. The chimney-piece is chiefly composed of Spanish Brocatelle, with plinth and sunk panels of black and gold, the moulded bases being of green marble. The festoons, cartouches, and armorial bearings (the latter emblazoned) are white marble.

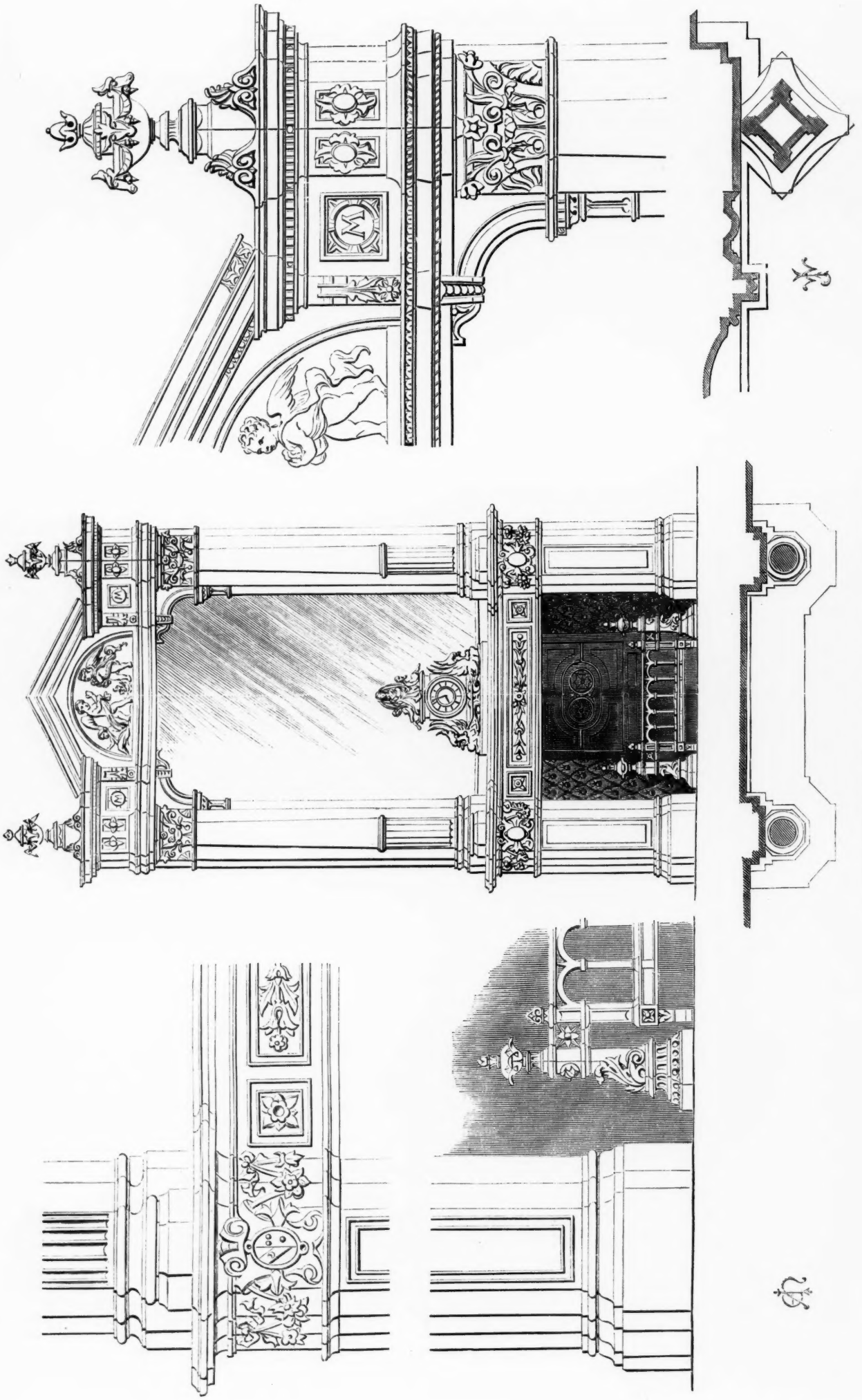
The fluted portions of the columns are griotte, the upper half being Sienna, and the astragal between of white marble. The capitals, of statuary, are in high relief, and support an entablature of diagonal projection. The latter, with the pediment, lunette, and frame at the back of the columns is mainly of camphor-wood, relieved by darker woods and marble bosses. The basrelief in lunette ("Summer") has a gilt background; other parts of the woodwork are gilded.

A black-and-gold marble fender, not shown in the engraving, encloses a hearth laid with encaustic tiles, which, like those on the splayed jambs, are from special designs. The hand-irons are electro-bronze enriched with ormolu.

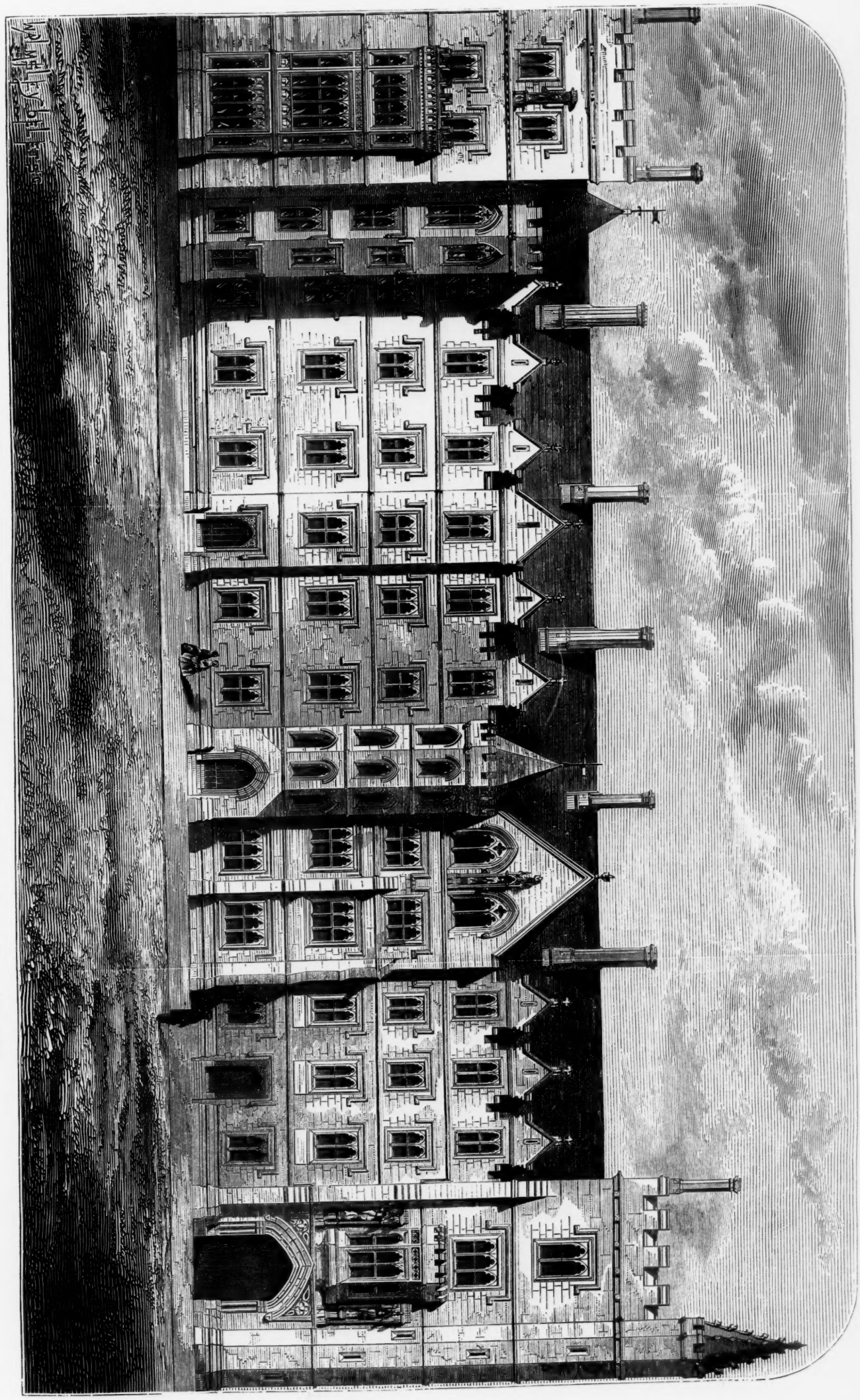
The fire-basket, a combination of cast and wrought iron, is constructed to insure strength and durability. The cast-iron back has suitable fire-tiles below. The ash-pan, made to run on noiseless wheels and easily removed, forms a desirable feature.

The elevation and plan are drawn to a scale of ⅜ in. to the foot; details, 1 in. to the foot.

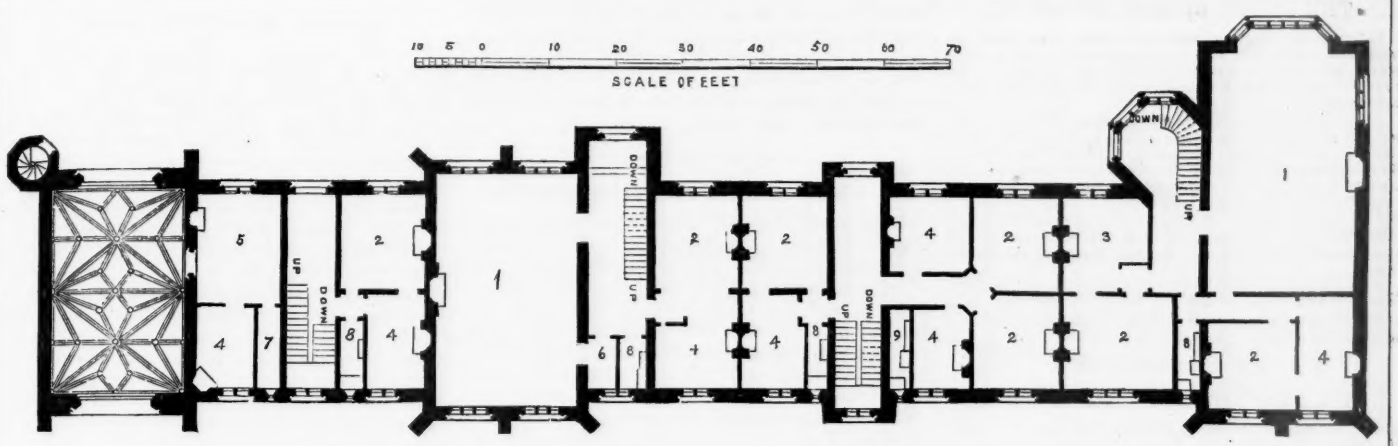
The whole is from designs prepared by Mr. Edward A. Heffer, of Liverpool, architect.



A CHIMNEY-PIECE.—Mr. E. A. Heffer, Architect.



ADDITION TO NEW COLLEGE, OXFORD.—Sir G. Gilbert Scott, R.A., Architect.



1. Lecture-room.
2. Students' room.
3. Students' bed-room.
4. Bed-room.
5. Porter's room.
6. Lavatory.
7. Pantry.
8. Scout.
9. Double Scout.

ADDITION TO NEW COLLEGE, OXFORD.——*Plan of Ground Floor.*

ENLARGEMENT OF NEW COLLEGE, OXFORD.

This college is being considerably enlarged, at a cost of upwards of 20,000*l*. The architect is Sir George Gilbert Scott, and the builders are Messrs. Jackson & Shaw, of Westminster. We give a view and plan of the new building, which will be 177 ft. long, 33 ft. wide, and 62 ft. in height from the bottom of the plinth to the ridge of the roof, and is situated on the north side of the college, in Holywell-street. It will afford thirty-eight sets of rooms to the college,—two for fellows, and thirty-six for students, besides two lecture-rooms. There will be four sets of staircases to the building. The external dressings and ashlar work will be of Milton stone, carefully chopped, and the internal portion of the walls will be of brick. On the south side, at the west end of the building, a tower, about 26 ft. square and 70 ft. high, will be erected. It will project about 22 ft. beyond the main building, and in the angle there will be an octagonal staircase. There will eventually be a gateway tower erected at the eastern end, but it is not included in the present contract. The front of the building will be on the south side, facing the city-wall. The work is expected to be completed by Christmas, 1873. The buildings now in course of erection are only a third part of an intended extensive range of rooms, stretching the whole length of Holywell-street.

INCIDENTAL CONSEQUENCES OF DRAINAGE OPERATIONS.

Sir,—Your pages have heretofore contained forcible reflections on the injuries to which great buildings are liable when, as in the case of the Somerset House river front, the normal condition of their foundation, as regards moisture, is materially altered, by draining and pumping. I wish to point out that consequences, akin, so far as cause is concerned, to such injuries to great buildings, are probably at present developing themselves in multitudes of little buildings in the suburbs of London, in a manner rather unpleasant to the inhabitants than absolutely ruinous to the structures themselves.

Say that my neighbour's house or my own was formerly furnished with a cesspool, disused since the Metropolitan Drainage Act came into operation. Say that the soil was removed either very carelessly or not at all, the jobbing builder employed saying that the hungry clay thrown in would soon sop up all cause of offence. Years roll on: the earth becomes desiccated through the action of the drainage scheme; fissures open in all directions, and serve as ventilators to all the old cesspools in the neighbourhood, whose effluvium distils into the houses.

Meanwhile, suppose that my pride lies in a miniature Bushy Park, consisting of a single horse-chestnut tree, formerly luxuriant in flower in the spring and in foliage in the summer and autumn. By the end of September it has now become nearly as bare of leaves as in mid-winter, for want of water to the roots. My suburban orchard of apple-trees had for some seasons declined in produce, but my pear-tree made a vigorous resistance to the railway-smoke and other obstacles, and still would present me with fruit by the bushel in a favourable year; but I now fear that even that is going the way of the apple-trees, and of all flesh, and succumbing to the general desiccation of the soil.

There is just one practical remark that this state of things suggests,—namely, that where a building operation in the neighbourhood of garden-ground involves a blind end to a new sewer, it should be the special business of somebody to see that the blind end is made impervious to water, and innocuous in draining the ground, when the gardener does not wish it drained.

Nemo.

MEMORIAL OF THE LATE SHERIFF YOUNG, M.P.

The foundation-stone of the above memorial has been laid by the daughter of the Mayor of Wisbech (Mr. F. Ford). The monument takes the shape of a column, standing in all 40 ft. high. At each corner of the base are antelopes, standing in all 4 ft. 7 in. high, the paws supporting a shield, each bearing arms carved in low relief, viz., the city of London and Middlesex, county of Cambridgeshire, Wisbech borough arms, and his family arms. On the sides of the base are engraved the following inscriptions:—

"A Memorial Tribute from many Friends to
ALDERMAN RICHARD YOUNG, J.P., D.L.
Born, 1809. Died, 1871.
Mayor of Wisbech, 1858—1863.
M.P. for Cambridgeshire, 1865—1868.
Sheriff of London and Middlesex, 1871."

On one side is also erected a drinking-fountain, of Portland stone and marble. The column is in red Kinsterry granite, the base of column in grey Aberdeen, the cap of column being metal and Portland; the steps in Yorkshire stone; the whole of the other work, including the antelopes, is in Portland stone. Mr. J. Wallis Chapman, of the Harrow-road, London, is the architect; and the contractor for the whole of the works was Mr. John Whitehead, of London. The granite is from the quarries of Messrs. D. & A. Davidson, of Inverness; the Portland stone from Messrs. Thornton & Co.'s quarries, Portland; the Yorkshire stone from Mr. J. Haigh's quarries, Morley, near Leeds; and the metal-work, from Messrs. Richardson & Slades, of High Holborn. The foreman in charge was Mr. W. Doncaster.

OPENING MEETING OF THE NEW ARCHITECTURAL ASSOCIATION OF IRELAND.

The opening meeting of the above association was held on the 3rd inst., the president, Mr. J. J. O'Callaghan, in the chair. Mr. J. H. Longfield having read a report from the committee, the president delivered his inaugural address, which will be found on another page.

Mr. Owen, president of the Institute of Architects of Ireland, in proposing a vote of thanks to the president for his wise, earnest, and encouraging address, said it would afford him the greatest pleasure to assist the Association in any way in his power. He was certain every member of the senior branch of the professional association of this country would feel satisfied at the prosperity of this new work, for to it they would look for the best recruits to the ranks of the profession.

Mr. Drew seconded the motion, which was adopted with acclamation.

Mr. Rawson Carroll proposed:—

"That the Association is deserving of the support of the profession at large."

Mr. Charles Geoghegan seconded the motion, which was adopted.

On the motion of Mr. Maguire, seconded by Professor M'Manus, it was also resolved:—

"That it is most desirable to enlist the sympathies of the other professions connected with architecture,—painting, sculpture, and engineering."

SALARIES OF ENGINEERS TO BOARDS

Sir,—In the list of salaries of engineers to municipal Boards, given at p. 802, *ante*, the amount, as regards Manchester, is not correctly stated. The salary of the city surveyor is 1,150*l*. per annum. I think it only right to make this correction, as public bodies are never too liberal in remunerating their officers; and the statements of a journal like the *Builder* are likely to be referred to when such appointments as those in question have to be made. J. Croxford.

Sir,—With reference to Hull, in your list, the *present* population of Hull, from the Registrar-General's return, is 124,976*l*. The salary of the borough engineer is 450*l*. S.

WORCESTER CATHEDRAL.

"Literal copyism is not intelligent restoration." Granted this dictum of "J. S." in last week's *Builder*, some explanation seems desirable to justify the propriety of the rough internal masonry now seen in places in the walls and vaulting, and of patches of green colour introduced in certain parts of the latter in the nave of the cathedral.

It was a dark age in the history of this building when the roof-covering was stripped off, and ordinary slates, such as are used in *small* sizes for *domestic* purposes, substituted. Atonement has been made in our day for acts of Vandalism perpetrated about the same time at Salisbury and at Hereford. Much has been done at Worcester with the same praiseworthy purpose; but still I must maintain that alteration in the present covering, as suggested in my communication of the 8th inst., is essential to the satisfactory completion of the work of restoration.

If slate must be the material, we have examples of its use in large slabs,—producing the effect desired,—on the church at Camberwell, by Sir Gilbert Scott, and on the Reform Club, by the late Sir Charles Barry.

Still, bearing in mind the covering generally used on the other edifices of this *monumental* description, which adorn our country, and remembering instances of their restoration, which have come, in the course of years, under my own observation, I venture to repeat the suggestion made in my former communication. N.

THE GLOBE BRIDGE, PECKHAM.

Having noticed, a short time since, some very unauthentic articles in the local papers relative to these works, which are very detrimental to the contractor, I am induced, in justice to the contractor, to trouble you with a few remarks.

An article has appeared in the *Peckham Times* upon the subject of the memorial-stone having been laid on Thursday last, the 10th inst., wherein it is stated that a Fenian flag floated over the stone. This was quite incorrect. No Fenian flag was there. The national flag of Ireland waved opposite the Union Jack, which floated over the head of Mr. E. Dresser Rogers whilst he successfully set the stone. The ceremony over, the contractor, Mr. S. Stanley Peach, provided the men with a substantial dinner at the Surrey View.

As I believe it to be the object of your journal to circulate only that which is fair and true, to every one, under every circumstance, I shall esteem it a favour if you will give these remarks a place in your next issue.

Fair Play.

THE AMENITIES OF COMPETITION.

Sir,—The unsuccessful ones in the late competition for the prizes offered by the Sunderland School Board will have small reason to rest contented under their want of success, if, as in my case, they have failed to receive that small modicum of courtesy which always soothes, viz., a word in acknowledgment of their efforts.

It would be invidious on my part to cavil at the decision of the Board, as I am in ignorance of the process by which it has been arrived at, or even, perhaps, to quarrel with the scheme of appointing two committees, the one to decide upon the best plan, and the other upon the best elevations; yet I am strongly of opinion that such a course can result only in injustice, unless the two sets of judges are in accord as to both plans and elevations of the same author. If otherwise, as would be the case, to a certainty, I presume A has received half a premium for his plans, and B the other half for his elevations.

It is, after all, annoying (setting aside the wound to one's *amour propre*, in the event of a failure, which is always supposed to smart, whether it be the case or no), to be judged by a set of rules to which one's efforts were never meant to be subjected, and which are directly at variance with the true spirit of competitive endeavour.

Justitia.

THE WINCHESTER SURVEYORSHIP.

Sir,—Finding that no notice has been taken of the above municipal hoax, I can only conclude that, unless they consider it beneath their contempt, none of the victims have had access to the local newspapers, and consequently are ignorant of what took place at the meeting of the Winchester Town Council, on Thursday, Oct. 3. Perhaps the following extract from the *Southampton Times* of Oct. 5th, may tend to throw some light on the subject:—

"Town Council Meeting.—The monthly meeting of this body was held at the Guildhall on Thursday; the Mayor (Alderman R. P. Forder) in the chair. The Finance Committee reported that in accordance with instructions from the Council they advertised for candidates willing to fill the office of surveyor, and that in reply thereto they received thirty-five applications, accompanied with testimonials; and having perused the same, arranged for a personal interview with three of the candidates, viz., Mr. Edward Dudley, of Kington, Herefordshire; Mr. J. J. Lancefield, of Winchester; and Mr. J. B. E. Bruce, of Kingston-upon-Hull; and pursuant to the terms of the resolution, submitted their names for the Council to make the selection.

Mr. Alderman Budden proposed, and Mr. Councillor Gale seconded, the adoption of the report, which was agreed to *nem. dis.*

Mr. Alderman Fielder, in proposing Mr. Lancefield for the office of surveyor, said he had the greatest confidence in his knowledge of the work to be carried out; he had been accustomed to buildings from his boyhood, and from his excellent testimonials he would also be able to carry out the system of drainage, and give the greatest satisfaction.

Mr. Councillor Gale seconded the nomination.

Mr. Harris thought the qualifications as indicated by the testimonials were insufficient.

Mr. Morris thought that the advertising was useless, and the discussions of the committee a waste of time. They had previously pledged themselves to vote, and could have saved the twenty-four gentlemen the trouble of dealing with what was a foregone conclusion.

Mr. Godwin observed that it was a doubtful farce to bring down those two gentlemen.

Mr. Warren, as a member of the committee, said there had been nothing done to induce Mr. Newman to resign, and though he should vote, he had not pledged himself to do so for Mr. Lancefield.

Alderman Fielder replied by stating that it was the unanimous opinion of the council that the office should be put up for public competition, so as to select a good man, and no other candidate being proposed, Mr. Lancefield was declared duly elected."

The inference from this is, that had the Winchester Town Council remembered what was due to their own honour, and been sufficiently candid to have added to their advertisement for a surveyor a note to the effect that the appointment was then virtually filled, they would not only have saved thirty-four gentlemen the trouble and expense involved in preparing their testimonials, to say nothing of the trouble given to their friends and supporters, but have merited the esteem of all right-thinking men. However, it is somewhat refreshing to find that even the Town Council of Winchester contains one or two men not wholly lost to a sense of justice.

It is not stated whether those two rival candidates who unwittingly took part in the "doubtful farce" of coming all the way from Kingston-upon-Hull, and Kington, respectively, had their travellingexp enses paid; but even if they had, it is still a matter of question whether the Corporation of Winchester is not liable to thirty-four actions for damages from the several victims of this dishonourable hoax.

Justitia.

BAPTIST COLLEGE FOR MANCHESTER.

Last week the foundation-stone of the new Baptist College, to be erected in Brighton-grove, Rusholme, was laid. The new building will be a spacious structure. The total frontage is to be 115 ft., and the total depth 77 ft., faced externally on every side with white fire-bricks, and relieved with terra-cotta moulded strings, label-moulds, bands, and friezes, with sunk and moulded devices on the face of the bands, and an elaborately moulded terra-cotta cornice. The principal feature in the front elevation will be a tower, with a slated high-pitched roof, surmounted with iron cresting, the total height being 70 ft. The bay-windows are also carried up above the roofs, breaking the line, and forming minor towers, having high-pitched slated roofs, terminating with ornamental ironwork. The principal entrance to the college is under the tower, leading to a spacious hall; from thence to the students' rooms, provision being made for the accommodation of about twenty-five students,—each having a separate room,—also a residence for the president. The ground-floor contains dining-hall, 40 ft. by 24 ft.; lecture-hall, 33 ft. by 24 ft. (by removing a sliding division, the dining and lecture halls may be converted into one room); class-rooms, study, president's rooms, and servants' department. The first and second floors contain the students' rooms, bath-rooms, lavatories, and president's bed-rooms. The works will be carried out under the direction and supervision of Mr. Henry Pinchbeck, of Norfolk-street, Manchester. Mr. James Herd, of Clarence-street, Cheetham, Manchester, is the contractor.

BUENOS AYRES.

A supplement to the *Packet*, a Buenos Ayres paper, of the 14th of September, contains a report by Mr. Revy, who was chief assistant there to Mr. Bateman, C.E., who proposed a scheme for a port at Buenos Ayres. Mr. Revy reports to the Provincial Government against Mr. Bateman's scheme, and in favour of one of his own for the construction of a port at Boca, and the cleansing and canalisation of the Riachuelo for the sanitary improvement of the district. A port for Buenos Ayres, according to Mr. Bateman, can be made: according to Mr. Revy it cannot. The construction of a port at the Boca, in Mr. Revy's opinion, offers every facility, at a comparatively trifling expense. There would be no breakwater, no embankments, no dry-earth excavations; nothing but simply to dredge the bed of the Riachuelo, cut one or two short canals, and build wharfs, quays, and warehouses along the banks, for which a solid foundation of tosca is obtained at 20 ft. to 30 ft. deep. The plans of the Boca Port present three large docks, together, 100 acres, with 4,000 yards of quays for loading or discharging merchandise. Several other docks could be afterwards constructed, as found necessary. The work would cost, in all, 144,000*l.*, without including wharfs, quays, and warehouses. Mr. Revy only undertakes the canalisation, and to provide a port of 16 ft. deep, suitable for hundreds of vessels which are at present obliged to anchor in an open roadstead, and which could discharge and take in cargo at the Boca in as many hours as at present days are necessary. The project is not an original one of Mr. Revy, for the late Don Manuel Lynch agitated an identical one in the columns of the *Packet* ten years ago.

The Louvre.—A new sculpture-gallery is about to be opened in the museum of the Louvre. This gallery is to be devoted to the sculpture from the national palaces, and to some of the finest productions already in the Louvre. At the end of the gallery is to be placed the statue of Michelangelo, which for a long series of years formed one of the glories of the famous Château de Chenonceaux, the art collections of which were dispersed five or six years ago; and the gallery will take its name from the great master. The decorations are now being completed, and the catalogue is being prepared.

CHURCH-BUILDING NEWS.

Duntisbourne Abbotts.—The ancient church of St. Peter, Duntisbourne Abbotts, has been re-opened for divine service, after having undergone a restoration. The village is picturesquely situated five miles north-east from Cirencester, and about half a mile south-westward from the high road from Cirencester to Gloucester, the "Irmin-street" of the Roman occupation. The church is a small stone building in the Early English style, and consists of a tower with three bells, nave, chancel, and porch. Having become dilapidated, the rector (who is also the patron of the living), the Rev. Thomas Hayes, with the aid of the lord of the manor, and other landowners and inhabitants of the parish, called in Messrs. Waller & Son, of Gloucester, architects, under whose superintendence a restoration has been carried out. The south wall has been taken down, and a new aisle and organ chamber erected. The east wall of the nave has also been taken down, and there has been erected a new chancel arch, supported on Aberdeen granite columns with carved stone caps. The whole of the interior fittings have been taken out, and new floors laid, with benches of varnished pitch-pine. The chancel fittings are of oak, and consist partly of the old seats. The chancel and altar floor is laid with Godwin's tiles. There are a new stone pulpit and a pitch-pine reading-desk. The organ-chamber is parted from the south-aisle by an open screen of pitch-pine. The porch has been rebuilt. The timbers in the new roof are of pitch-pine, stained. The old roofs of the nave and north aisle and chancel have been generally restored, and strengthened with new timbers. The tower and the walls of the north aisle have also been restored and pointed. The total cost has been about 1,000*l.* The whole of the works have been executed by Mr. A. Estcourt, of Gloucester.

Honor Oak.—The foundation-stone of St. Augustin's Church, Honor Oak, has been laid by Mr. J. G. Talbot, M.P. The new building is situated on a hill near Honor Oak-road, and will be in the Early English style. At present it is intended to contain only one aisle, but a second will be added, together with a tower, whenever the requisite funds are forthcoming. It will accommodate 390 persons, and the estimated cost is 3,200*l.*, of which the greater part has been subscribed. The architect is Mr. Oakley, of London; and the builders are Messrs. Roberts, of Islington.

Cowley.—The church here has been re-opened by the Bishop of Gloucester, after restoration. The restoration consists of a new roof to the chancel, with trussed rafters and principals resting upon moulded oak plates, and a stone dog-tooth cornice, with corbelled shafts under the principal timbers, provision being made for a rood-screen (the remains of which were discovered) at the junction of the nave and chancel. The curved timbers and braces of the nave roof have been opened out, and the woodwork repaired. The nave has been filled with oak open seats, copied from the existing old late fourteenth-century seats, some of which have been retained in their original positions. The remains of the stairs to the rood-loft that were discovered during the progress of the works have been opened out, the font restored, and the Jacobean pulpit replaced by the old fifteenth-century stone, one that was used as a base to the more modern work. In the chancel the new work further consists of oak seats, prayer-desk, lectern, and sedilia; new steps of red Mansfield stone; and a new communion-table. The remains of early decorative colouring have been retained as far as was possible. The whole of the stone-work has been cleansed from the many coats of whitewash with which it was covered. The spaces within the steps in the chancel have been paved with Minton's encaustic tiles, and the rest of the chancel with the old monumental slabs. In the nave the passages are paved with small black and red tiles. On the outside the walls have been under-pinned and strengthened with buttresses. The windows have been glazed throughout with pale lilac and white glass in patterns. In the chancel three of the windows have been filled with painted glass by Messrs. Powell, viz., in the east the Crucifixion, and in two side-lights figures of the Virgin Mary and St. John. The north doorway has been opened out, and, with the south and west doorways, fitted with oak doors, framed in small panels, and hung with wrought-iron ornamental hinges, lock-straps, &c. The work was under the superintendence of Mr. Albert Hartshorne, and

has been executed by Messrs. Wall & Hook, of Brinscombe. The cost of the restoration of the nave has been in great part defrayed by the squire of the parish, Mr. J. Hutchinson, Cowley Manor, and his relatives and friends; that of the chancel by the rector and some of his family.

Welford.—The ancient Church of St. Mary the Virgin, Welford, has been reopened for divine worship, after restoration. The chancel of the church was restored about four years ago, and its internal ornamentation was carried out by the rector, the Rev. G. A. Poole. At that time the nave and aisles were in such a condition as to require immediate restoration. In the early part of the present year this difficulty was fairly grappled with, and the result was that the whole fabric, with the exception of the tower, has been restored. The architect employed was Mr. E. F. Law, of Northampton. The total cost of the restoration is about 2,300*l.*, the work done to represent that sum being somewhat as follows:—In the first place, the north aisle has been rebuilt. Previously to the restoration, this part of the church was blocked up with enormous square piers and semicircular arches, the arcade apparently at some time or other having been removed. A new arcade, of the Decorated period, has been inserted, having carved capitals, with natural characteristic foliage of the period. The north aisle at the west end is also carried beyond its original position, and the extension is converted into a small sacristy. Its entrance arch is supported by two decorated columns, of the same character as those just noticed, and it is lighted in the west wall by a small Early English window, which has been filled with coloured glass. The south arcade was considerably out of the perpendicular. It was Early English, and, in order to preserve its character, it was deemed expedient to take it down stone by stone, which were either marked or numbered, so that, when rebuilding, each might be fitted into its original position. The tracery in the windows of the south aisle had been destroyed, but their ridges have been reinstated in original form, and are filled in with lead-lights. On the exterior of these windows a number of old carved heads have been inserted. The west gallery has been removed, and the tower-arch having been opened and restored, its proportions are no longer hidden, the effect being considerably heightened by the Perpendicular west window which comes into view. The nave-walls have been restored. The roofs to the nave and aisles are new, and are made of pitch-pine, moulded. The church has been reseated in oak throughout. The seats are of modern construction, without doors. The four windows in the north aisle are filled in with coloured glass. A coloured window has also been placed with the east window of the south chapel by members of the Ferraby family, and the subjects represent the "Annunciation," "Espousal," "Wise Men," and the "Presentation at Jerusalem." Towards the total cost, that for the north aisle, including windows, has been about 800*l.* Mr. Phillips, of Northampton, executed the carving work.

Elstead.—St. James's Church, Elstead, has been reopened after alterations and repairs. The original structure, dating back probably to the thirteenth century, had not only become dilapidated in some parts, through age and exposure, but was manifestly insufficient to afford the accommodation required for an increasing congregation. It was, therefore, determined to erect an additional aisle, and to effect other improvements, so that the interior might be rid of its characteristic unsightliness, and the general arrangement of the edifice suited to the present period. The expense attending the alteration amounts to 1,000*l.* A south aisle has been built, and a vestry added to the east end of the church, while the sittings have been altered, and the character of the building so changed, as to allow a better distribution of light, ventilation, and sound. The antiquated fabric to which these desirable additions have been made, consisted only of a nave and chancel, with a low wooden steeple at the west end, the gallery, to quote the expression of the bishop of the diocese, being of "a most villainous description," the pews "horrible," and the ceiling "low." Additional accommodation is now afforded to about 100 hundred persons, the total number of sittings being about 400. The plans were prepared by Mr. H. B. Garling, architect, of Southborough Hall, near Tunbridge Wells, and carried out under the personal superintendence of his manager, Mr. Johnson, by Mr. Pink, builder, of Milford, near Godalming. The new aisle is lighted by eight windows, some of the heads of which are formed of stonework of the former windows, belonging apparently to the thirteenth and fifteenth centuries. A new three-light window has been inserted beneath the tower at the west end, the stained glass in which was contributed by Mrs. Cornwall, and the tracery carved by Miss Cornwall, her daughter. The building is composed of Bargate stone with Bath stone quoins and dressings, red and black tiles being used in the pavement, excepting the chancel, where Maw's encaustic tiles are laid down. The new portion of the roof rests upon four columns with five arches. The shafts of these are composed of Forest of Dean stone, with capitals and dressings of Bath stone.

Buxted.—The church at Highhurst Wood, erected mainly through the liberality of Colonel and Lady Catherine Harcourt (and consecrated some time ago by the Bishop of Chichester), has been publicly opened for divine worship. Highhurst Wood is a hamlet of Buxted; it is distant some three miles or so from the parish church. In the early part of last year the building was commenced by Mr. Charles Lulham, of Uckfield, from designs furnished by Mr. Christian, of London. The principal materials used in its construction were obtained from the immediate neighbourhood; the stone, of which the church is exclusively composed, being excavated from a quarry about 500 yards from the spot, and the sand used in the composition of the mortar being equally well to hand. The church, which consists merely of a nave terminating in a semicircular apse with a side aisle on the north for children, is built in the old English style, and is of a simple character. The roof of the nave is supported by stained wood rafters, that of the apse being domed, and the spaces decorated. The chancel is approached by several flights of steps, and is backed by the altar. The floor is inlaid with pitch pine, the aisle being paved with Staffordshire tiles; Minton tiles forming the floor and steps of the chancel. The church is lighted by six windows, and the apse by five. The principal window, which faces due west, is glazed with coloured glass. This is the special contribution of Lady Catherine Harcourt, who has painted the window with her own hand. It is not yet finished. The building provides accommodation for 260 adults and children; the seats, which are movable, being backed, and fitted with book-shelves. Arrangements have been made for heating the church with hot air in the winter time. Surmounting the nave is a small bell-turret, in which are hung a couple of bells. The structure is surrounded with a wall of stone; and in the rear half an acre of ground has been appropriated for the purpose of interment. The total cost of the erection is about 3,000*l.*, nearly the whole of which has been borne by Colonel Harcourt. A parsonage is in course of erection about 300 yards from the church, and a school for upwards of 100 children will shortly be commenced, not far from the spot.

Stoke.—The chancel of the parish church has been re-opened. It has been restored by the liberality of Mr. W. F. Pridmore, Wyken House, at a cost of 300*l.* It is lined throughout with encaustic tiles, and the altar-railing was designed by Mr. F. Skidmore.

STAINED GLASS.

Market Weighton Church, Yorkshire. — A stained-glass window of one light by Mr. J. W. Knowles, of York, has recently been placed in this church, near the font. The subject is our Lord Blessing little Children. The cost of the glass has been defrayed by subscription from the ladies of the parish. The drawings for the stonework were a present from Messrs. Atkinson, of York, under whose care the church was restored last year.

St. Martin's, Brighouse.—A stained-glass window has been placed in the north side of this church, to the memory of the late Mr. Brooke, of the Rhydings. The subjects represented are the Birth of our Lord, and the Presentation in the Temple. The window is from the works of Messrs. Morris & Co., of London.

St. Andrew's, Gravesend.—Three-stained-glass windows have been presented by Lady Franklin to the St. Andrew's Waterside Mission Church, in memory of the petty officers, seamen, and marines of the *Erebus* and *Terror*. Beneath the windows brasses, with the names of each of the crews will be placed. These ships sailed from Gravesend.

St. Peter's and St. James's, Belgrave-cum-Birstall.—The east windows of the two churches of Belgrave-cum-Birstall, Leicestershire, have lately been filled with stained glass by Messrs. Ward & Hughes, in memory of the Rev. Richard Stephens, B.D., late vicar of Belgrave-cum-Birstall. The window in St. Peter's, Belgrave, consists of five main lights, which are occupied by ten representations of events in our Lord's life, two in each, under characteristic canopies—viz., the Adoration of the Shepherds, Our Lord's Baptism, His Accusation before Pilate, Bearing His Cross, the Crucifixion, the Entombment, the Angel and Women at the Sepulchre, the Appearance of the Twelve with Thomas, and the Ascension. The large circle in the apex contains a seated figure of our Lord in glory, orb and sceptre in hand, surrounded by the Heavenly Host, and below this are two groups of censing angels. The architecture is of the latest geometrical, and the glass accords with it. The colours are deep-toned. St. James's, Birstall, was restored by Sir G. G. Scott, R.A., only two years before the death of the late vicar, and the simple east window, of the Early English period, consists of three main lights, which are occupied with representations of the Adoration of the Shepherds, our Lord's Crucifixion, and the Angel and Women at the Tomb after the Resurrection; above are emblems of the Trinity, with the Lamb and Dove, and between these an angel choir in two groups. The canopies and ornamental work are in character. This window is raised by his widow and his unmarried daughter. A reredos in each church is about to be erected under the direction of Sir G. Scott, by the parishioners and a few friends, in memory of their late pastor.

St. Thomas's, Halifax.—A stained-glass window has been placed at the east end of this church, in memory of Alderman Midgley and his wife. The window, erected at the expense of the various members of the family, is done in the style of the German school of glass-painting, and is from the studio of Mr. Wailes, of Newcastle. The window is a five-light one, and the subject chosen is the Good Samaritan, three pictures from which are portrayed. On the dexter side the window, at the lower portion, the traveller is represented as falling among thieves; occupying the whole centre of the window is the scene where the good Samaritan relieves him, whilst the priest and Levite pass by "on the other side;" and in a corresponding portion on the sinister side of the window, the departure from the inn is pictured.

Cromer Church.—The west window in the tower of this church has just been completely restored, and fitted with stained glass, at the expense of Mrs. Charles Buxton, as a memorial of her husband, the late Mr. Charles Buxton, M.P. It is a Perpendicular window, 35 ft. high and 13 ft. wide. Fortunately, there was sufficient evidence remaining on the jambs and fragments of the tracery upon the old churchyard wall to enable the original design to be followed. The battlemented tracery is of a similar character to the aisle windows, which were restored ten years back. The tracery of the head and transome is filled with stained glass, of a foliated pattern, in bright colours, and the upper panes are glazed with Powell's embossed quarry glass, having coloured borders. Five painted figures, representing St. Thaddæus, St. Mark, St. Paul, St. Simon. and St. Philip, are introduced in the lower panes. They came, we understand, from a church in Posen, Prussia, and are very old. The stonework has been executed by Mr. Stanley, of Norwich, from the design of Mr. J. H. Brown, architect, Norwich.

Miscellanea.

Accidents.—In Derby, at a bakehouse in Upper Brook-street, a patent oven was being erected, with divided compartments in order to facilitate the dispatch of baking. Whilst a workman was engaged in finishing one of the archways, the roof fell in, and he was instantly buried. The removal of the *débris* took upwards of half an hour, and the poor fellow was quite dead before his body could be recovered.——A bricklayer at Uddingston has been killed by a fall from a chimney-stalk. He had been, at the dinner-hour, coming down the inside of the stalk, at present being erected at one of the new pits near Uddingston Railway Station, when the rope which was attached to a needle at the top of the chimney gave way, and he fell to the bottom, a distance of 64 ft., and was killed instantly.

Constant Metropolitan Water Supply.—Alderman Sir Sidney H. Waterlow (the Lord Mayor elect) has published in the *Times* a statement as to the supply of water in a district crowded with the working population, and in which the Improved Industrial Dwellings Company, over which he presides' have recently erected, at a cost of nearly 17,000*l.*, 112 three, four, and five-roomed tenements for the working classes; namely, upon a large plot of land leased from the Baroness Burdett-Coutts, in Crab-tree-row, Bethnal-green, nearly opposite Columbia Market. An improved system of constant water, he said, has been adopted during the last two years in buildings erected by his company in Pimlico, George-street Grosvenor-square, and Goswell-road. In all these dwellings the system has been found to work admirably. The water is supplied by meter at a fixed price per 1,000 gallons, and at the end of each year the total cost has been less than under the ordinary system of rating each tenement. When the buildings in Crabtree-row, however, were opened, it was found the East London Water Company were unable to deliver a drop of water into three out of five tanks, the three being 9 ft. above the others, and at an elevation of only 55 ft. above the level of the pavement. The Water Company said that, under a private Act of Parliament obtained about twenty years ago, the highest point to which they are bound to raise water is 40 ft. At the Gladstone Buildings, containing 168 dwellings, and situate within a few hundred yards of Crabtree-row, the New River Company give a daily supply at 59 ft. Yet the East London Company charge as much 1,000 gallons as those who serve the other districts. What, he adds, would the wealthy inhabitants and legislators who dwell in the lofty houses at the West End say if the water companies refused to supply water on the third floors of their houses, or at a height greater than 40 ft.? He is afraid the public can have no redress in this matter until the Legislature interferes.

The New Chelsea Embankment.—Since August last, the works have been progressing in the hands of Mr. Webster, the contractor. The length of the wall of the new Embankment is 4,430 ft. The segment of reclaimed land at its widest point, opposite the angle of Cheyne-walk, is about 140 ft. in width; and the area to be laid out in ornamental gardens is about 9½ acres. The thickness of the wall at the bottom is 12 ft.; it is being built with Portland cement concrete, the cement being supplied by the Burham Company, and regularly submitted to engineering tests before use. At the top of the wall, which is to the level of the road, the thickness is diminished to 5 ft.; it is faced throughout with granite, only roughly axed. The use of cement concrete for the wall in lieu of brickwork reduced the expense of the undertaking by about 21,000*l.* The granite is being supplied partly by Mr. Fyfe, of Aberdeen, and other portions by Messrs. Freeman, from Cornwall, and the Dalbeattie Granite Company. There will not be an open balustrade, but a solid panelled parapet, with bold moulded coping and square pedestals at intervals. There are 3,173 ft. of the lowest portion of the wall completed, and 1,220 ft. of the parapet. The filling-in of the area behind will require about 200,000 yards of earth, of which a large quantity has been already provided. The low-level intercepting sewer, corresponding in length with the Embankment, will be constructed of Gault bricks from the Burham Company, the lower third of the inner ring lined with blue Staffordshire bricks from Messrs. Doulton & Co., of Lambeth. Some portion of the sewer at the lower end has already been put in. The ultimate destination of the low-level sewer is the western pumping station. Mr. Webster has also obtained the contract for erecting buildings connected with the western pumping station, and for the extension of the low-level sewer westward to the Chelsea Embankment. The tender amounted to 126,950*l.* The same contractor has got the work of providing engines, pumps, and machinery at the station: amount of tender, 56,789*l.*

Tax on English Locomotives.—At the last meeting of the Great Luxemburg Railway Company, the chairman stated that the Belgian Government had imposed a duty of 200*l.* upon all railway engines imported from England. He added that English engines were much better than those made in Belgium, and more economical, although the first cost was greater.

Utilisation of Water Power.—Of the use that might and ought to be made of now wasted water power in many districts we have often spoken. A step in the right direction has been taken at Bellegarde, where the Rhone, after issuing from the Lake of Geneva, falls into a deep chasm. After passing for some distance between these walls of stone, the river falls suddenly into a huge fathomless gulf. An American conceived the idea of turning the force of this mass of water to account, and creating a power for a number of industrial operations. England and Switzerland found the necessary capital, seven millions of francs, and the work is approaching completion. About 100 yards above the fall, is a dam and a basin, by means of which the water is diverted into a tunnel, 600 mètres long, 10 mètres wide, and 20 mètres high, and which opens into the ravine of the Valserine. At this point a large building is erected to receive turbines, which are calculated to give a force equal to 3,000 (steam) horse-power. The subterraneous aqueduct is continued 700 mètres beyond this first point of operation, and conveys the water to another set of turbines, of 5,000 nominal horse-power. The total force of the water diverted is said to be equal to 12,000 horse-power, so that 4,000 remain for future application. The motive power is obtained and brought into subjection, and will soon be applied to various industrial purposes.

The New Church of St. Silas, Bristol.—In the spring, St. Silas Church, St. Philips's, was found to have subsided 20 in., owing to the bad foundations, and as it was in a dangerous condition, it was resolved to take the church down and rebuild it on piles. Mr, J. P. Stephens was the contractor for the taking down and rebuilding, and Mr. W. Mereweather, of Bedminster, undertook the piling. Mr. Davis was clerk of the works. About 300 piles of 28 ft. in length and 10 in. in diameter, of English larch, have been driven in, and it is intended to build the church of the old materials, and on nearly the same plan as before. The cost of the building was estimated at 2,100*l.*, exclusive of the boundary-wall, not in the estimate. According to the altered plan the height is reduced, and wooden arches constructed to support some of the weight of the roof. The piling having been finished, the ceremony of relaying the foundation stone has now been performed by the Rev. Flavel S. Cook, who, in the course of an address, said he had appealed to the public for 1,500*l.*, and they had given him 1,700*l.*; but, as usual, the cost was more than was estimated, and about 200*l.* were required to complete the undertaking, exclusive of the boundary wall.

Distribution of Forests in India.—An important and able paper, signed "D. Brandis," appears in the October number of *Ocean Highways*, "On the Distribution of Forests in India." The author is of opinion that in India forest conservancy, in Government hands, has become necessary, in order to meet the growing demands for timber, wood, bamboos, and other forest produce, all the more especially as the peasantry and others begin to desire substantial houses, and there seems no prospect of finding coal in sufficient quantity in North-western India; but he is not hopeful of the possibility of increasing the rainfall to any considerable extent by preserving and extending the forests, or of thereby in any way altering the climate; and, indeed, he considers that there is not yet sufficient evidence to prove that any material deterioration of climate has been the result of denudation in any part of the country. The seasons in India are regulated by the two half-yearly winds, dry and wet, which are cosmical. But a great deal can be done by improving and extending the wooded tracts along the borders of the dry country, and these and other like extensions may be beneficial to the sanitary conditions of districts.

The Annual Trade-Union Congress.—The Trades' Union Parliamentary Committee, of which Mr. Alexander M'Donald is president, and Mr. George Howell secretary, in exercise of the powers conferred upon it by the last Trade Congress at Nottingham, has just issued a circular to the various trade councils and trade societies throughout the United Kingdom convening the fifth annual Trade-Union Congress, to be held in Leeds in the first week of January next. The Congress is to last six days, and the details connected with its sittings will be under the superintendence of Messrs. Denton and Plockett, the president and secretary of the Leeds Trades' Council

The Preservation of Alexandra Park and Palace.—A meeting was held on Thursday in last week at the Mansion House, for the purpose of enabling the Lord Mayor to report to the committee the result of an interview which he had had with the proprietors of the Alexandra Palace and Park. After doing so, it was resolved that,

"as the owners of the property are unwilling to sell unless a deposit of 100,000*l.* can be paid or guaranteed to be paid at a certain date to be named in the contract; and believing that if time be given to the skilled artizans and working men to subscribe money for the purchase of the property the whole of it will be forthcoming; believing also that the 100,000*l.* required to be paid as a deposit will be forthcoming by a certain day to be named in the contract of purchase, provided the Lord Mayor and sub-committee be able to purchase the property on such fair terms and conditions as they may consider to be fair and reasonable; that as soon as the terms of the contract shall have been agreed on, the Lord Mayor's suggestion be adopted of holding an evening meeting at the Mansion House."

A form of guarantee with regard to the 100,000*l.* was agreed upon, by which any deficiency which the guarantors might have to make good should be paid out of the first money forthcoming from the shareholders. An executive committee was formed for the purpose of collecting subscriptions for shares.

The Sand Process of Engraving on Glass.—A new step of progress in this very curious process has been made. It consists in the substitution of the force of mere gravitation for that of steam or blast power. A box, or hopper, of suitable dimensions, is placed near the ceiling of the room, and from it depends a small tube of about 8 ft. long. No machinery whatever is used. The sand or emery-powder to be used for engraving is placed in the hopper, and regulated by a slide at the top: it falls down through the tube, under the end of which is held the glass, watch-case, cup, or other object to be engraved. In a few minutes the designs are cut with a great degree of exactness and beauty. Sufficient protection is afforded by designs of paper being pasted upon the surface to be engraved, or by writing or drawing the design on the glass with gelatinous or india-rubber ink. The cutting-powder is used over and over again, being transferred from the tray in which the work is placed to the hopper.

New Music Hall in Southampton.—This place of amusement has been erected at the rear of the Royal York Hotel Above-bar. The large hall is nearly completed. The walls are divided by piers finishing above the main cornice, with circular tops, having a shell ornament on the face of same; from the cornice springs a cove, having circular-ended panels, fitted with enriched ventilating gratings. The ceiling is divided into three compartments. In the centre of each compartment or panel a large circular ventilating flower is introduced. Twelve smaller flowers are placed at regular distances, and from these the chandeliers will descend. Private boxes are provided at the east end. There is a gallery the length of the hall on the south side, arranged outside the main walls and over the entrance passage to the stalls. The stage is at the west end. The building was designed by, and is being erected under the superintendence of, Mr. Bedborough, architect. Mr. Gambling is the builder.

Fall of a Suspension Bridge, Paris.—The suspension-bridge known as the Pont de Constantine, erected in 1838, to connect the island of St. Louis with the Quai St. Bernard, has just fallen into the Seine. It was suspended to two cables of iron wire, to which were attached long rods supporting the planks. These had been gradually worn away by the continual oscillations caused by the tread of passengers, and the iron had become rusty, so that it had been undergoing repairs for nearly a month past. At about five o'clock on Tuesday afternoon, owing to the rupture of the cable on the side of the Jardin des Plants, it gave way. About fifteen workmen were precipitated into the water, but were all rescued.

Proposed New Pier and Harbour for Newlyn.—A meeting of the promoters of the new harbour at Newlyn has been held at the offices of Messrs. Borlase & Milton, solicitors to the proposed company, under the designation of the Newlyn Harbour and Pier Company (Limited). The plans of Messrs. Trounson & Son were submitted and approved of by the meeting, and who are to be the working engineers, under the direction of Mr. N. Douglas, C.E., who will be the consulting engineer of the company.

Restoration of the West Front of Wells Cathedral.—A meeting to promote this object has been held in the chapter-house at Wells, to receive a report from the committee superintending this work, upon what has been done and what it is proposed to do. The meeting was influentially attended, and a considerable addition was made to the subscription-list. It appeared from the state of the account, as made up to the day preceding that of the meeting, that there were no funds, and that the liabilities on the work then in progress would exceed the assets by about 500*l.* Before the close of the committee-meeting, however, their anxieties were relieved and their hopes encouraged by the announcement of additional subscriptions, which not only covered existing liabilities, but left a goodly sum in aid of the amount required for further action. The report was unanimously adopted, and it was farther resolved—

"That in the opinion of this meeting the work of restoration, so far as it has at present proceeded, has been satisfactorily executed, and it is desirable that it should be forthwith completed, and to that end the committee be requested to take steps to raise the necessary funds."

The clergy throughout the diocese were invited to make collections in aid of the work. Several liberal subscriptions were announced in the course of the meeting.

Demolition of Wysall Church.—A correspondent of the *Notts Guardian*, in reference to the unavoidable demolition of this interesting church, with the view of rebuilding it, says:—

"I found the vicar with several careful workmen busily employed in taking down portions of the nave and aisles of Holy Trinity. Evidently the work had been deferred to the latest moment, for the falling beams told us the worshippers must oftentimes have been aware 'there is but a plank between us and death.' Mounted on a ladder, the energetic and excellent vicar was scraping and deciphering from the south wall the plastered fragments of an ancient creed and some remains of a memorial of the family of Widmerpool. Among the *débris*, the curious Norman font, a lycnoscope in the north wall, and the still beautiful and wonderful monuments to Hugh Armstrong and Mary his wife (the latter a Sacheverell of Ratcliffe), 1572, could not escape especial notice. . . . A careful and reverential treatment of the sacred edifice, and all its belongings, may confidently be relied on; and we are glad to learn that a well-known historian of the neighbourhood, the author of 'Charnwood Forest,' will soon favour the public with a detailed description of the wonders of Wysall."

The Tuileries.—"We are in a position," says the *Temps*, "to complete the information which we lately gave relative to the reconstruction of the Palace of the Tuileries. The plans drawn up during the Empire will be carried out for that portion which skirts the Rue de Rivoli, and thus the Pavillon de Marsan will be rebuilt on the model of the Pavillon de Flore at the other angle; whilst as to the Pavillon de l'Horloge, it will be erected in conformity with the design of Philibert Delorme, and be surmounted with a wide passage, as in the time of Marie de Medicis. The wings which unite it to the pavilions at the corners of the Rue de Rivoli and the quay will be replaced by galleries with arcades, which the public may pass through to go from the Place du Carrousel to the garden."

The Metropolitan Railway.—At a special meeting of shareholders in the Metropolitan railway, the report of the Committee of Investigation, recently published, was adopted by a very large majority, and the gentlemen recommended by the committee were appointed the new directors, Sir Edward Watkin being appointed chairman. A resolution was carried, empowering the directors to raise a sum of 250,000*l.* by the issue of new redeemable preference shares. In the course of his speech, Sir Edward Watkin stigmatised the payments made to Mr. Fowler, the engineer—150,000*l.* in addition to 30,000*l.* for extra work, besides 157,000*l.* from the Metropolitan District Railway — as "monstrous." He expressed his belief that by prudent and economical management, and unity amongst all parties, the future of the undertaking would be satisfactory.

Blackpool Market Accommodation.—It has been unanimously resolved by the Local Board not to carry out any one of the three successful plans for a new market for which premiums have been given. It has also been resolved that Mr. Gorst, the Board's surveyor, get out plans and specifications for increased market accommodation; it having previously been decided that the wall be taken out of the market, and a roof supported on iron pillars and girders placed over the shambles.

Mr. Mechi on the Sewage Question.—In a letter to the *Times*, Mr. Mechi, of Tiptree Hall, expresses his satisfaction to think that the question of the sewage for the soil is affirmatively settled, and his conviction that the secondary question how to apply the sewage to the soil will ultimately be solved, according to circumstances. The intermittent system he urges is the true one, as also is the alternating of shallow-rooted and deep-rooted plants, allowing of occasional cultivation, as has been his practice for twenty years. He thinks it is unjust to condemn Mr. Brown's (spray) system at Bishop's Stortford before it has had a fair trial. It is evident, however, he adds, that we are only slowly and very gradually arriving at the true means of properly utilising the vast manurial treasure of the country.

Improvement in Railway Signalling.—Mr. Sutton, the superintendent of the Central Division of the London and North-Western Railway, has effected a great improvement in Birmingham. By a new arrangement of signalling there will be no more screeching from engines within the station, except for shunting, or pilot engines. From all the departure platforms telegraph wires have been laid down communicating with the pointsmen's signal-boxes at each end of the station. When a train is ready to start the superintendent unlocks the signalling-box, and signals in what direction the train is going. On receiving the signal that a train is ready to start, the pointsman shows the signal, "line clear," and the driver starts his train without any preparatory whistling.

The German Empire and the Vienna Universal Exhibition.—The new German empire is making extraordinary exertions to occupy a conspicuous position at the forthcoming Universal Exhibition at Vienna, next year. Not only has the Government undertaken to defray almost all expenses, for which purpose the Imperial Parliament has voted a large sum of money, the Imperial Commission at Berlin has also offered facilities to the German Exhibition, which entirely throw into the shade our own country; the British Commission for the Vienna Exhibition being practically without any funds whatsoever, to render the least assistance to English exhibitors.

Fall of a Chapel near Dewsbury.—The Heckmondwike Moravians had called a meeting in their chapel in Oldfield-lane, but just two hours before the gathering was to have taken place one of the outer walls and the whole of the roof of the building collapsed, and fell inwards. The falling timbers, ceilings, and outside wall smashed everything into pieces they came into contact with. The benches were a complete wreck, the organ was rendered useless, and the pulpit was totally destroyed. The building was a very old one, and would soon have been discontinued being used as a chapel, as the Moravians are building a new one in Walkley-lane.

Discovery of Tombs.—In the commune of Hardthausen, about a league from Hagenau, some interesting tombs have been recently opened. The head of one skeleton lay on a pillow of bark, and the skeleton was loaded with ornaments. Round the neck were rings, and on the arms were bracelets, while rings were also found encircling the bones of the fingers. Rings also encircled the thighs and legs, and about the head were numerous pins, which had served as ornaments for the hair. On the breast was an oval copper-plate, on which lay a number of nuts in excellent preservation, and two nuts were found pushed in between the teeth.

A Costly Affair.—Mr. James Gordon Bennett is, it is said, about to erect over the grave of his father, in Greenwood Cemetery, a monument which, it is believed, will be the finest thing of the kind in America. It will take the form of a tall massive shaft of white marble, elaborately sculptured with symbolical figures representing the profession of journalism. The inscription will be simply "James Gordon Bennett, aged seventy-two—Founder of the *New York Herald*." The monument is to cost somewhere about 50,000*l.* The *Herald* does everything on a large scale.

Closing of City Churches.—Two more London churches are destined to follow those which have been destroyed. The doomed edifices are St. Martin's Outwich and St. Peter's-le-Poer.

East London.—A committee of the St. George's (East) vestry has been appointed to provide plans for the widening of Victoria-street, which is considered to be a most desirable improvement, a point upon which no two opinions can be entertained. It is proposed to ask the Limehouse District Board and the East London Railway Company to co-operate in effecting the improvement, and if their assistance can be secured, the work may be carried out without much difficulty. It is possible that the Metropolitan Board might also be induced to contribute.

Floating Baths in the Thames.—The notion of establishing floating baths in the Thames is beginning to take tangible shape. At the next Court of Common Council Mr. Deputy Stapleton will move,—"That it is highly desirable that this Corporation should construct and maintain for the use of the citizens floating baths on the Thames as soon as the main drainage of the metropolis is effected, and that it be referred to a committee to inquire into the cost of construction, and the probable annual outlay for the maintenance, if any, and to report generally thereon to this Court."

Ventilation of Sewers.—The Board of Works of the Halifax Union, having re-arranged the sewerage of the Poor-house, have since applied Mr. Henry Stott's (West Vale) system of ventilating sewers. The main sewers of the house are connected to the draught of the boiler-fires by earthenware pipes, and made air-tight by a simple apparatus made of cast iron. The draught draws all the sewage-gases to the fires, through which they are passed, and taken up the chimney-stack. Thus the sewers are constantly and perfectly cleansed from their poisonous gases, and all parts of the house rendered free from smells.

Greenwich Hospital.—The 10,000*l.* voted by Parliament for the alteration and utilisation of Greenwich Hospital are being expended by three out of the four extensive wings being cleared out and fitted up for the purpose of a naval college, under an Admiralty contract with Messrs. Smith, builders, London. Accommodation is being prepared for 700 young men. In addition to bed, day, and class rooms, there will be a theatre, naval museum, and gymnasium, for the use of the students, who, in addition to the usual classical and naval instruction, will be taught the art of shipbuilding.

Warming Railway Carriages in Germany.—A mode of more safely and effectually warming railway-carriages than by stoves or hot water has, it is said, been widely adopted in Germany. The invention consists of the use of a composite fuel, which only smoulders slowly, and is encased in an iron tray enclosed in a copper box "hermetically closed." The heat is said to last for 24 hours if necessary. The fuel is called the "charcoal brequettes." At 13*l.* per ton the cost is said to be almost nominal, and the apparatus costs only 30*s.* for each compartment.

"Testing a Gas-holder."—With reference to our notice of the accident to a gasholder at Hollinwood (p. 813), the clerk of the works, Mr. J. P. Ruddock, writes,—"The person who caused the accident has nothing whatever to do with the new building, but is a servant of the Corporation, who interferes with things he knows nothing about. Unless this is mentioned the blame may fall on me, and I had nothing whatever to do with it."

Improved Railway Communication for Southampton.—Under this title a pamphlet by Mr. A. D. Dawnay, C.E., London, has been issued, advocating the formation of a new line of railway westward from Southampton direct to Wilton, near Salisbury, for the facilitation of communication with the West of England and South Wales. The estimated cost of the whole undertaking is 378,500*l.* The route would not, it seems, offer any considerable engineering difficulty beyond that of a tunnel at Downton.

Epsom College.—The memorial-stone of a master's house for the accommodation of forty pupils was laid last week at the Royal Medical Benevolent College, Epsom, by Mr. Erasmus Wilson, F.R.S., who has undertaken to defray at his own expense the entire cost of erecting the new building, amounting to upwards of 5,000*l.* The building is designed by Mr. George Elkington, of Cannon-street, the college architect; Mr. Shepherd, of Bermondsey, is the contractor.

The Albert Memorial Chapel, Windsor Castle.—A number of wooden cases, containing portions of the sarcophagus which is to adorn the interior of the Albert Memorial Chapel have arrived. The marble sculptures composing the sarcophagus were forwarded by Baron Triqueti at Paris, and immediately upon their arrival were deposited in the Albert Memorial Chapel, when the sarcophagus will be erected upon the floor of the interior, at the east end. An effigy of the Prince Concert will surmount the sarcophagus.

Extension of the Meat Market at Smithfield.—A meeting of the members of the Markets Improvement Committee has been held at Guildhall, to further consider the plans and specifications of the intended extension of the Metropolitan Meat and Poultry Market, Smithfield, and also to give directions for taking out quantities and nominating builders to be written to for tenders for the execution of the works.

Unveiling of Two Statues at the Wickliffe Congregational Church, Leicester.—The ceremony of unveiling the statues of Wickliffe and Latimer, which are placed in niches in front of the Wickliffe Congregational Chapel, London-road, Leicester, has been performed by Mr. J. Stafford (mayor). The attendance was not numerous. The statues are the work of Mr. John Firn, of the Midland-street Marble Works, Leicester, and are cut in white stone.

Mortuary for Warrington.—The Town Council of Warrington has determined to erect a public mortuary in their borough, and has fixed upon a portion of the borough cemetery, about a mile from the centre of the town, as a site for the building. In style the building will be Gothic, and it will be constructed chiefly of bricks, and with an open timber roof. Mr. R. Vawser, of Warrington, is the architect.

A Great Bridge over the Nile.—A bridge has just been completed spanning the Nile at Cairo. Its total length is 1,353 ft. and its width 38 ft. It is composed of girders resting upon stone piers, and the centre span swivels to allow vessels to pass through.

A Find near Rome.—We hear of the discovery of an antique statue near Aspra, not far from Rome. It is of white marble, life-size, and is described as representing a Venus naked to the waist, and of the best school of Greek art. It has been sent to Rocca-Antica.

Builders' Benevolent Institution.—We mention, with desire to assist, that the anniversary dinner in aid of this institution will take place on Thursday, November 7th. Mr. Edwin Lawrence will preside.

The Architectural Association.—The first trumpet to announce the opening of the Society season in London is blown as usual by the Architectural Association, who will lead off with a *conversazione* next Friday evening, the 25th inst.

Hyde Park.—The Commissioners of Works have caused to be erected in Hyde Park a granite pedestal and iron standard surmounted by a board, to mark the spot where alone it shall be lawful to hold public meetings.

Fleet Sewer.—The Metropolitan Board of Works have entered into a contract with Messrs. Nowell & Robson to carry out this work for the sum of 62,997*l.*, Mr. G. Wall having withdrawn his tender for 54,000*l.*

Holloway Workhouse.—The roof of Holloway Workhouse being in a dangerous condition, the City guardians, to whom it belongs, have given order for its reparation.

The Crown Lands.—The net income from the Crown lands in the year ending the 31st of March last was 375,000*l.*

TENDERS

For alterations at the Lord Hill, Westbourne Park. Mr. Cotton, architect. Quantities not supplied:—

Brown	£2,075	0	0
Capps & Co.	1,936	0	0
Kelly, Bros.	1,877	0	0
Beach	1,649	0	0

For the erection of nineteen cottages at Camberwell. Mr. H. Connew, architect:—

Alen (accepted)	£2,800	0	0

For new house and warehouse, in Commercial-road, Whitechapel, for Messrs. J. Nixon & Sons. Quantities supplied:—

Thorpe	£1,500	0	0
Sheffield	1,479	0	0
Wicks & Bangs	1,387	0	0
Moyle	1,360	0	0
Ennor	1,321	0	0
Brown	1,315	0	0

For the erection of seven dwelling-houses, with shops and other premises, St. Andrews-road, Hastings, for Mr. John Woodcock. Messrs. Cross & Wells, architects. Quantities supplied:—

Bridgland	£7,372	0	0
Jones	6,390	0	0
Parks	6,315	0	0
Vidler	6,225	0	0
Longhurst	6,157	15	0
Avard	5,872	0	0
Stenteford	5,100	0	0

For offices and stalls on the Hastings and St. Leonard's Promenade Pier. Messrs. Cross & Wells, architects. Quantities supplied:—

		Partly Roofed with Lead.
Howard	£3,350	£3,475
Vidler	3,270	—
Tupper & Carr	2,980	3,066
Brown	2,971	3,050
Avard	2,971	—
Jukes, Coulson, Stokes, & Co.	2,935	3,013
Patman & Fotheringham	2,920	2,976
Stenteford	2,793	2,886

For warming the Pavilion on the Hastings and St. Leonard's Promenade Pier with hot-water apparatus. Messrs. Cross & Wells, architects:—

Truss	£896	0	0
Bacon & Co.	820	0	0
Jukes, Coulson, Stokes, & Co.	730	0	0
Cheale	725	0	0
Smeaton & Co.	716	0	0
Huggett	690	0	0
Jennings	676	0	0
Barrow & Wilson	670	0	0
Fraser, Bros.	615	0	0
May	598	0	0
Jones & Son	578	10	0
Alderton & Shrewsbury	570	0	0
Wontner & Smith	525	0	0
Cumming & Edmonds	500	0	0

For building new schools, &c., in Church-court, Kensington. Mr. Gordon Hills, architect. Quantities by Mr. William Smith:—

Chapple	£6,135	0	0
Patman & Fotheringham	5,975	0	0
Myers	5,921	0	0
Hockey	5,700	0	0
Higgs	5,695	0	0
Sawyer	5,693	0	0
Hills & Sons	5,455	0	0
Dove, Bros.	5,355	0	0
Stimpson & Co.	5,275	0	0
Manley & Rogers	5,087	0	0
Cullum	4,894	0	0

Reinstating Mount Ash-road, Upper Sydenham. Messrs. Corfe & Parker, architects:—

Lawrence	£190	0	0
Clark	155	0	0
Cole	130	10	0
Wood	123	0	0

For alterations and repairs to seven houses, Quaker-street, Spitalfields, London. Messrs. F. & W. Stone, architects:—

Pettigrew & Moyes	£472	0	0
Anley	449	0	0
Langmead	435	0	0

For alterations and additions to factory, No. 65, Mansell-street, Whitechapel, for Messrs. J. Jacobs & Co. Mr. John Hudson, architect:—

Wall	£840	0	0
Little	753	0	0
Read & Son	716	0	0
Jacobs	694	0	0

For Stanningfield new Parsonage-house and stables, &c., near Bury St. Edmunds, Suffolk. Mr. E. Christian, architect. Quantities not supplied:—

		Allowed for old House Materials.
Rednall	£2,450	
Pearson	2,356	£10
Sanders & Sons	1,835	70
Vickers (accepted)	1,522	50

For new school at Stanstead, Suffolk. Mr. Fowler, architect. Quantities not supplied:—

Scott	£346	0	0
Cadge	251	18	6
Pearson	237	0	0
Theobald	219	10	0
Smith (accepted)	201	18	0

For the erection of vineries, melon-house, and sundry works at Shooter's-hill, for Mr. N. Carter. Mr. G. Judge, jun., architect:—

Blake & Ramplen (accepted)	£500	0	0

For new Wesleyan Chapel, Nuneaton, Warwickshire. Mr. W. S. Burton, architect. Quantities supplied:—

Marriott	£1,860	0	0
Linnells	1,570	0	0
Towers	1,408	15	2
Neal	1,350	0	0
Sackree	1,350	0	0
Hardy	1,290	0	0
T. & G. Harrold	1,247	15	0
Spencer	1,183	18	8
Fox & Hood (accepted)	1,160	0	0

For wool-spinning mill and offices, Newarke-street, Leicester, for Messrs. Brierley & Sons. Mr. W. S. Burton, architect. Quantities supplied:—

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Bland	£3,795	0	0
Ratcliffe	3,764	0	0
Kellett	3,667	0	0
Duxbury	3,563	5	0
Osborne, Bros.	3,460	0	0
Neal & Sons	3,437	0	0
Scott	3,420	0	0
Hutchinson	3,409	0	0
Eagle (accepted)	3,378	0	0

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Pegg	1,068	11	0
Cort & Paul	1,055	0	0
Gimson & Co. (accepted)	1,043	5	6

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Lucas	8,050	—
Morter	8,052	162
Hayward	8,095	210
Myers & Son	7,949	200
Axford & Co.	7,827	216
Allen & Son	7,697	169
Axford	7,502	149

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Gammon & Sons	11,240	0	0
Nixon & Sons	11,192	0	0
Webster	11,079	0	0
Brass	10,985	0	0
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Morter	10,673	0	0
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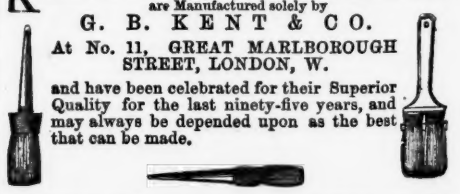

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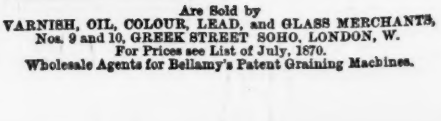

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